

ELECTRICAL CONTRACTING

February, 1937

Vol. 36

No. 2

With which is consolidated
The Electragist
and Electrical Record

Established 1901

HOWARD EHRLICH
Vice-President

EARL WHITEHORNE
Editor

FRANK J. SEILER
Associate Editor

GLENN SUTTON
Manager

W. A. CYR
Pacific Coast Editor

ALICE McMULLEN
Assistant Editor

Contents

- 5—Strangled with Tight Wires—*An Editorial*
- 7—The New Wiring Handbook—What It Means—
By Allan Coggeshall
- 9—Making a Malt Plant Modern
- 11—Corporation or Partnership—*By J. A. Gerardi*
- 12—Switching for a Path of Light
- 14—Saving Shop Time with Tags
- 16—Selling up a Wiring Job
- 18—The Approved List and How to Use It—*By H. B. Smith*
- 20—Twelve Store Lighting Suggestions—*By Dean M. Warren*
- 22—3,000 Small Houses to Boost the Boom
- 43—Maintenance Section
- 58—Editorials

Service Departments

- 27—Methods of Other Contractors
- 30—Among the Motor Shops
- 34—For Better Lighting Jobs
- 40—Questions on the Code
- 62—High Lights in the News
- 75—News of NECA
- 84—Equipment News
- 92—With the Manufacturers
- 94—Advertisers' Index



A SERVICE PAPER for electrical contractors, engineers, motor shops, industrial electricians and inspectors, covering engineering, installation, repairing, maintenance and management, in the field of electrical construction — industrial, commercial, residential

McGraw-Hill Publishing Company, Inc.

Publication Office, 99-129 North Broadway, Albany, N. Y.
Editorial and Executive Offices, 330 W. 42nd St., New York, N. Y.

JAMES H. McGRAW, JR.,
Chairman

MALCOLM MUIR,
President

JAMES H. McGRAW,
Honorary Chairman

HOWARD EHRLICH,
Vice-President

B. R. PUTNAM,
Treasurer

D. C. McGRAW,
Secretary

Branch Offices: 520 North Michigan Ave., Chicago; 883 Mission St., San Francisco; Aldwych House, Aldwych, London, W. C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta.
Published monthly, price 25 cents a copy. Subscription rates: U. S. and Canada, \$2 a year; all other countries \$2.50 a year. Entered as second-class matter August 29, 1936, at post-office at Albany, N. Y., under the Act of March 3, 1879. Printed in U. S. A. Copyright 1937, by McGraw-Hill Publishing Company. Cable address: "McGrawhill, New York." Member A.B.P. Member A.B.C.



Wire is only as good as its

Insulation

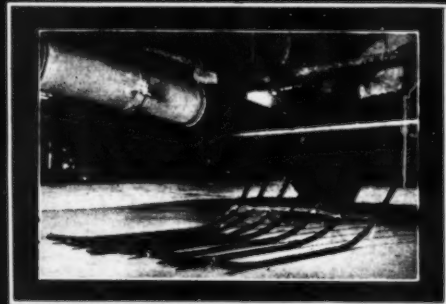
Abrasion

USELESS AS A WORN-OUT SHOE is the electrical wire, cord, or cable whose insulation has surrendered to the forces of abrasion!

RESISTANCE TO ABRASION is an outstanding characteristic of U. S. Tempered Rubber compounds for electrical conductors. Born in the twin crucibles of laboratory and speedway, U. S. Tempered Rubber has proved its abrasion-resistant qualities in thousands of scientific "torture tests" and in millions of road miles on U.S. Tires. To the buyer or the seller of electrical conductors, there can be no profit in good wire, poorly protected ...for wire is only as good as its insulation. That is why it pays to specify U.S. Rubber Insulation for all electrical wires and cables.

. . .

KEELHAULED by a truck! In this gruelling abrasion test, market samples of insulated wire were dragged over concrete and macadam highways. While U. S. Tempered Rubber Insulation showed insignificant wear, other insulations were worn through to the conductors! Actual results of these tests will be furnished on written request.



United States Rubber Company

United States Rubber Products, Inc., New York, N. Y.



The SAFETY SWITCH THAT HAS Everything

BULL DOG

Vacu-Break

SAFETY SWITCH

The Switch that has EVERYTHING you expect... but PLUS features... The Bull Dog VACU-BREAK Safety Switch, insulator as SAFETY and efficiency and economy. Has not a new high standard of performance that is obtained by the ordinary switch. As the BULL DOG Vacuum Break Safety Switch, a safe, distinguished switch of appearance which reflects its superior insular QUALITY.

EXCLUSIVE VACU-BREAK FEATURES

The VACU-BREAK Switch is of design... all wiring DOUBLE SEALED by vacuum safety switching. Compact design... all types and capacities... without increasing size... quick wiring... Solid brass wire grips for... change the switch... quick and easy wiring.

Modern Stylized cabinet with handles to mount.

The Modern
STYLED
Cabinet

The Safest,
Most Modern,
Most Efficient,
Safety Switch
Ever
Designed

BULL DOG ELECTRIC PRODUCTS COMPANY

Manufacturers of Safety Switches, Fuses, Light and Power Panel Boards, Switchgear, Dist. Systems

DETROIT, MICHIGAN

BULL DOG ELECTRIC PRODUCTS OF CANADA LTD. TORONTO, CAN.

Strangled by Tight Wires

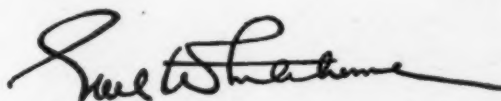
AFTER YEARS OF TALK the electrical industry has decided to do something about wiring. It does not know just what or how. But it does know that the market for electric light, appliances and energy is being slowly strangled by tight wires.

UP TO NOW IT HAS BEEN THE CUSTOM to blame all this on the contractor. "He should install more outlets, heavier circuits", they said. But the automobile industry did not wait for the gas station man to get the good roads built. When they saw there could be no mass market without good roads, they made that the Number One Job. They spent their money and together they got it done. And merrily we roll along.

ELECTRICAL MEN HAVE HAD SOME EXPERIENCE that should guide us with this Number One Job of ours. Some time ago the lack of domestic load was blamed on the dealer. But power companies were then competing, with cut prices and premiums. Nobody made any money. Progress was slow. Today, everybody is cooperating to create demand and build dealer sales, and the load is growing so fast, that wiring pinches.

NOW WE HAVE A BIGGER JOB THAN THAT—to get 'America rewired for today's needs—in homes, stores, offices and factories. And it calls for more than just cooperation. The new wiring Handbook will help. NEMA's \$50,000 program will prime the starting. But all the manpower of the industry must work on it—and many millions. Why, it took \$25,000,000, spent in five years on promotion, to get electric refrigeration rolling. And this idea is harder to sell.

IF WE WANT TO BUILD GOOD ROADS for electric service, we better look this whole job in the face—now. It is everybody's problem. It offers everybody profit.





The WHISTLE'S BLOWING!

*... it means business
for CONTRACTORS!*

Slowly . . . steadily . . . Industry is mobilizing for recovery! Industry will need motors, wire and conduit, electrical work. That means business—for somebody.

To alert contractors, it means even more than that. It means new selling opportunities—opportunities to turn what would be small orders into real sales. But it's up to the contractor.

He can show prospects that industrial efficiency is the only road to industrial *profits* in an era of rising costs. He can show how electrical modernization can increase that efficiency.

He can sell signal systems by showing how they save time . . . energy . . . money. He can sell better lighting as a means to increase production per man. He can sell re-wiring . . . motors and control.

When he does he will be making profitable work for himself. And if he sticks to *quality* in materials . . . the Graybar kind of quality . . . he will be making a reputation that will be bound to grow in the years to come.

GraybaR

ELECTRIC COMPANY

OFFICES IN 79 PRINCIPAL CITIES: Executive Offices, GRAYBAR BLDG., NEW YORK, N. Y.

Electrical Contracting, February 1937

By
**Allan
Coggeshall,**

*Member, N.E.P.A.
Electrical Committee*

The New Wiring Hand Book

The contractor member of the Industry Committee
that produced it tells what it is worth to you.



E. A. Brand

*Chairman of the
Hand Book Committee*

FOR the past year and more an industry technical committee has been working on the development of a "Handbook of Interior Wiring design." This committee, established by the four major national associations of the industry, consists of—E. A. Brand, Niagara Hudson Power Co., Chairman, Arthur L. Abbott, National Electrical Manufacturers Association, O. J. Brady, West Penn Power Co., Max Gysi, Brooklyn Edison Co., George S. Merrill, Nela Park, W. S. Stewman, New York Power & Light Corp., Ralph B. Ward, City of Newark Electrical Department, Richard G. Slauer, Westinghouse Lamp Co., Secretary, and Allan Coggeshall, Hatzel & Buehler.

Its purpose was to produce a practical supplement to the National Electrical Code, that would guide and stimulate the modernizing of electric wiring systems in all types of buildings. The code deals with numerous standards of safety. The

handbook was to present recommendations for adequacy.

It has been a laborious job. We have come together time after time, month after month, submitted what we have written, discussed and deliberated and stayed with the job until it was done. No one has received any compensation for his time or effort, not even R. G. Slauer, of the Westinghouse Lamp Company, who has acted as secretary of the committee and borne the burden of the actual writing of the handbook in its final form.

Why did we do it? Because we all believe that wiring is going to play a vital part in the next phase of the development of the electrical industry that now lies ahead. A home building boom is now impending and a general wave of modernization in both commercial and industrial buildings is already in process. We felt it of the utmost importance



that some kind of a standard guide be available to all branches of the industry to aid in the re-wiring of America.

It seems quite appropriate that this job should have been done in this way. The National Electrical Code itself was a cooperative product of the electrical industry first issued in 1897. The real beginning of the cooperative enterprise however dates even further back to October 19, 1881 when a "Standard for Electric Light Wires, Lamps, etc." was first issued by the New York Board of Fire Underwriters.

Value of the Code

Certainly the "National Electrical Code" is a mighty instrument, and yet in itself it has no intrinsic legal status. It becomes effective in law only as it is recognized and adopted by municipal and state ordinances.

The code has proved itself to be a sound document, and has earned for itself a unique place in the general scheme of things electrical. It is not good sportsmanship to violate the code. It isn't cricket. The National Electrical Code is something we can bank on, be proud of, and continue to support whole-heartedly. But we must not expect the code to perform more than its proper functions.

Purpose of Code

The purpose of the code, as proclaimed in its text, is the practical safeguarding of buildings and their occupants from electrical hazards. It prescribes minimum standards for safety but does not attempt to offer design specifications or to function as a manual for uninformed or untrained persons. In fact the code itself, in certain portions of its own text, recommends that architects go beyond the minimum requirements as set forth and make ample provisions for raceways, etc. to allow for future increase and growth.

It is in recognition of this need for planning for the future that the industry has now developed the Handbook of Interior Wiring Design. It is expected that this handbook will be available for distribution within a month and that it will precede the issuance of the 1937 edition of the code. The code itself, in its 1937 revision, will also represent a further industry development in that it will appear in a new form, with its subject matter re-arranged editorially, so as to accomplish a

more logical sequence of rules and prepare the way for orderly future development. And like the code, the handbook seeks to appeal to all branches of the industry and to the public and to coordinate earlier efforts and separate offerings by individual branches of the industry.

For the electrical contractor the handbook should have an especial ap-

simplified and improved conditions for the electrical contractor. He can feel a just pride in the code and the part he has played in the making of it and similarly he can relish the advent of the handbook and the part that it may play in bringing about further standardization of electrical fashions.

A Further Stimulant

While the electrical industry has been cooperating in the shaping of rules and standards it has by no means suppressed ingenuity and individual development in electrical applications. It is thought and hoped that this handbook may act as a further stimulant in that direction.

For example, let us assume that as a result of the recommendations contained in the handbook the owner of a commercial building, where the wiring system is twenty years old, is shown that he can no longer satisfy the electrical needs of his tenants. The electrical contractor who knows that building best is then in a position to put his ingenuity to the test and find out what can be done about it. How can the feeder system of the building be revamped to increase its capacity most economically? And in making his survey and studies of the building, what combination of instruments can he employ to most quickly and cheaply reveal the true facts of the electrical behavior and possibilities of the wiring system as installed?

As Loads Increase

That is the function of the handbook, to stimulate modernization of all kinds of obsolete wiring systems throughout the country, to guide the electrical contractor in re-wiring and re-equipping these buildings for modern needs. If electrical loads increase, and they will, a new field of opportunity is opened for the electrical industry. Clearly it is up to the electrical contractor to discover, what he is going to do about it? And it is to serve him in this emergency that this Handbook of Interior Wiring Design is presented.

The release of the handbook this year is fortunately timed to coincide with improved conditions in the general building industry, as well as the availability of new devices and new developments in the electrical field. Green lights are now indicated on several different avenues for orderly advancement and progress.

WHAT THE HANDBOOK WILL CONTAIN

I Advantages of Adequate Wiring

II Residence Wiring

- A—Adequacy Standards
- B—Specification Forms
- C—Sample Specifications

III Lighting Fundamentals

- A—Principles, Methods, Equipment Terminology, Data.

IV Wiring for General Occupancies

- A—Multi-family Dwellings
- B—Industrial, Commercial and Public Buildings
- C—Power Wiring

V Design of Wiring Installations

VI Contracts and Specifications

Forms of Agreement, Drawings, Material and Installation Specifications

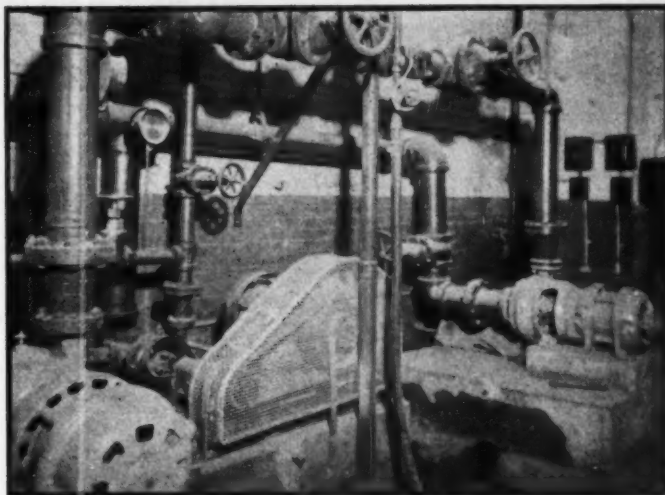
In succeeding issues, R. G. Slauer, secretary of the Industry Joint Committee will analyze the several sections of this Hand Book and show how the contractor can use it to his best profit.

peal. He has long had to play a very careful role in the electrical scheme of things. He is neither architect nor consulting engineer and he is not always the contractor, but often just one of the sub-contractors.

There can be no doubt that the electrical code has exerted a profound influence on the industry and by its establishment of re-organized minimum standards has greatly



1908 PASSES—Hand starters yield to button-operated type. The old-timer awaits removal to the scrap pile.



PUMP DRIVES—Three individual motor units, with automatic pressure and float controls replaced one 15 h.p. motor and its obsolete manual control equipment. Human error was thus avoided.

Making A Malt Plant Modern

**A Buffalo Contractor Rejuvenates
A 45 year old Electrical System
And Efficient Production Follows**

IMPROVEMENTS in the brewer's art have also necessitated many changes in the malting industry. To keep step with these demands from the highly mechanized plants that make our beer and ale, the Perot Malting Co. of Buffalo, has just completed a rewiring program, that replaces an electrical system of 1908 vintage with the best ideas in present-day use. The Sterns Electric Equipment Co. did the original job and have just completed this new installation at a cost of \$40,000.

Beyond the usual problems of providing adequately for an increased power demand, this plant had some special conditions to meet—moisture, varying temperatures in adjoining rooms, control of grain handling equipment, and supervision of processes that extended into several parts of the plant. Here then was an opportunity to modernize different drives and controls, and to revamp the wiring on a more efficient basis.

Beginning with the transformer station, which was equipped with

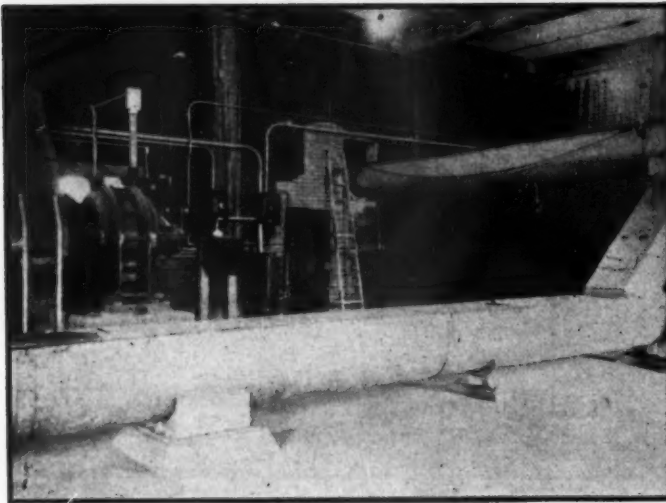


MODERNIZED CONVEYORS—The beginning of a 500-foot sectionalized line to carry germinated grain, over an electrically interlocked system with five motor drives at various locations.

units of larger size, the old main switchboard was replaced and new feeders were routed to modern load distribution centers. Old manual type motor controllers were scrapped throughout the plant to make way for magnetic types. Magnetic controls permitted the use of interlocking hook-ups and the installation of push button control stations at several convenient step-saving locations.

One series of screw conveyors, for example, extended for about 500 ft. through various parts of this plant. This conveyor system employed five motor drives, each of which was provided with interlocked controls to prevent incorrect starting sequence, and also to protect against grain spillage should any section of the conveyor system become shut down at any time.

While the plant underwent certain structural changes and additions, the electrical system was brought up to modern standards in all hazardous areas. Those sections in which dampness or condensation were



JOURNEY'S END—After a 500-foot trip up through conveyors, the grain is under safe electrical control, with no spillage or jammed boppers. The 75 h.p. leg motor at the left is interlocked.



OUT OF DANGER—Intermediate drives in this plant have controls in safe places, because push buttons do the job.



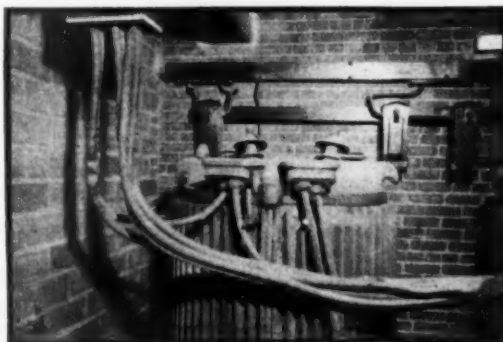
FOR EXAMPLE—A 40-h.p. elevator leg motor and its discarded manual auto-starter. The wall equipment is part of the magnetic interlock wiring and the magnetic starter for a 3 h.p. gearmotor, driving the manlift that has several convenient control stations.



MORE SAFETY—A dead front board replaced a live face switchboard to provide safer feeder protection. It is free of dust and damp, near the transformers.

harmful to wiring materials, were provided with new raceways. These were properly gasketed and sealed off to exclude moisture and prevent damage to new insulation.

This industrial contracting organization sold more than a job of re-wiring to meet added loads. What had originally been a good electrical job, for 1908 practice, was thoroughly modernized in layout and equipment. It now performs in keeping with 1937 methods in general use by the malting industry.



IN THE VAULT—Modernization included three new 200-kva. transformers for 440-volt power, and a 25 kva. 2200/110 volt unit for lighting. The main switchboard just beyond the rear wall gives a compact central source of power.

REALIZING that the situation created by the new income tax laws presents a problem to all corporations, Mr. Gerardi was asked to write a frank opinion for the readers of **ELECTRICAL CONTRACTING**. Here it is. Clearly there is something to be said for partnership, these days. It will be wise, therefore, for every contractor to examine his own position in the matter and discuss it with his own lawyer. Maybe something should be done.



Corporation or Partnership

WHICH IS BEST NOW?

By J. A. Gerardi

*Member New York and District of Columbia Bars
Counsel for McGraw-Hill Publishing Company, Inc.*

THE principle of taxation of corporations, on a basis depending upon the percentage of profits distributed by them, which was injected into the Federal income tax laws last year, will undoubtedly survive many sessions of Congress. The present administration has definite ideas that the accumulation of wealth by large corporations is a menace to the welfare of the people. Certainly it will make strenuous efforts to preserve and possibly extend the doctrine of distribution of wealth through the Federal taxing powers.

Even if a reduction in taxes should come in a future now remote, it is likely that the undistributed profits tax will survive. This being so, it would seem to be the part of wisdom for corporate executives to study carefully their form of organization with a view to rearrangement, if the situation should so demand.

One of the most absorbing problems one encounters in the reorganization of corporations, to effect legitimate savings in taxes, is that involving the dissolution of an existing corporation and the conduct of its business as a partnership or a proprietorship, that is, an individually owned business.

This problem must be confined to those instances in which the stockholdings in a corporation are held by a relatively small group of persons, since a partnership or proprietorship form of organization would be entirely too unwieldy if there were numerous partners or owners. But in the electrical contracting industry, a large number of units consist of small corporations whose stock is closely held, so that in this field there is ample room for serious consideration of the subject.

At the outset it should be pointed out that the practice of changing the

form of a business organization to effect legitimate savings in taxes has been sustained time and again by the highest court in the land. Furthermore, there is much evidence to indicate that the present administration not only does not frown upon but probably favors any proper measures which would result in the entire net income of a business being distributed and taxed in the hands of the individuals owning the business, as is the case with partnership income.

The undistributed profits tax is a penalty for failing to pass on the income to individual stockholders, so that it may be subjected to individual taxes. Partnerships and proprietorships are not considered as taxable entities. The only tax assessable is that which the individual partners or proprietors are required to pay based upon their proportion of the earnings of the business.

In what respects do Federal tax laws discriminate against corporations in favor of partnerships or proprietorships? First and foremost, a partnership or proprietorship, as such, does not pay the normal tax which a corporation pays or any

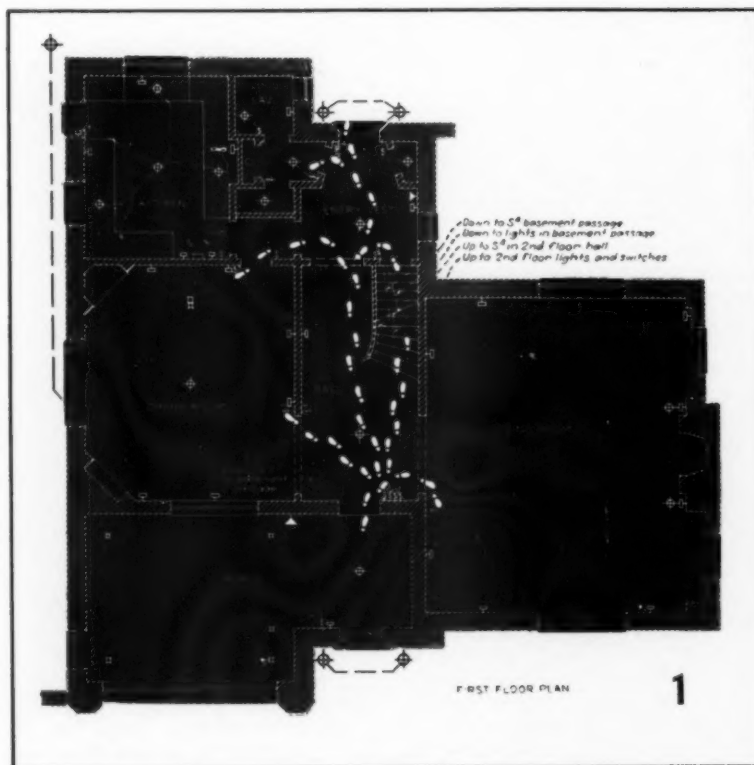
(Continued on Page 60)



WIRED FOR COMFORT — Complete switching and provision for future needs made the wiring in this house figure 7½ per cent of total cost.

THIS Westfield, N. J., installation provides a lighted pathway through the house in all directions and suggests a method of selling the architect and owner on the comfort value of switches at every entering doorway.

Switching for a Path of Light



UP FROM the days of groping for pull cords and stretching for key sockets, we have come into an age where convenience is king and comfort is a word to conjure with. It is time to capitalize this ruling motive in selling better house wiring jobs. And this means not only plenty of outlets but switches so placed that they will light a path through the house in any direction.

A new home recently completed at Westfield, N. J., gives a good example of switch control well planned for convenience. With a basement, garage, first, second and third floors in active use, this home required generous treatment in the matter of switching, if unnecessary steps were to be avoided. Three flights of stairs, three points of entry and a considerable footage in passageways presented "traffic" problems that involved not only comfort and safety but economy, through avoiding waste in burning lights left behind, because they could not be easily turned off.

Wiring was installed by Dengler, Liddy, Burd Electrical Co., of Eliza-

HAVE YOU TRIED LAYING A TISSUE OVER THE ARCHITECT'S PLAN, SHOWING IN FOOT PRINTS, WHERE SWITCHES ADD COMFORT

1

AS YOU COME—First floor hall lighting is controlled on approaching from the front or rear or garage or from upstairs. A rear yard flood turns on from either hall or garage door.

2

BEFORE YOUR FOOTSTEPS—First, second and third floor lights are handy where you want them as you walk. The footprints tell the story of convenience.

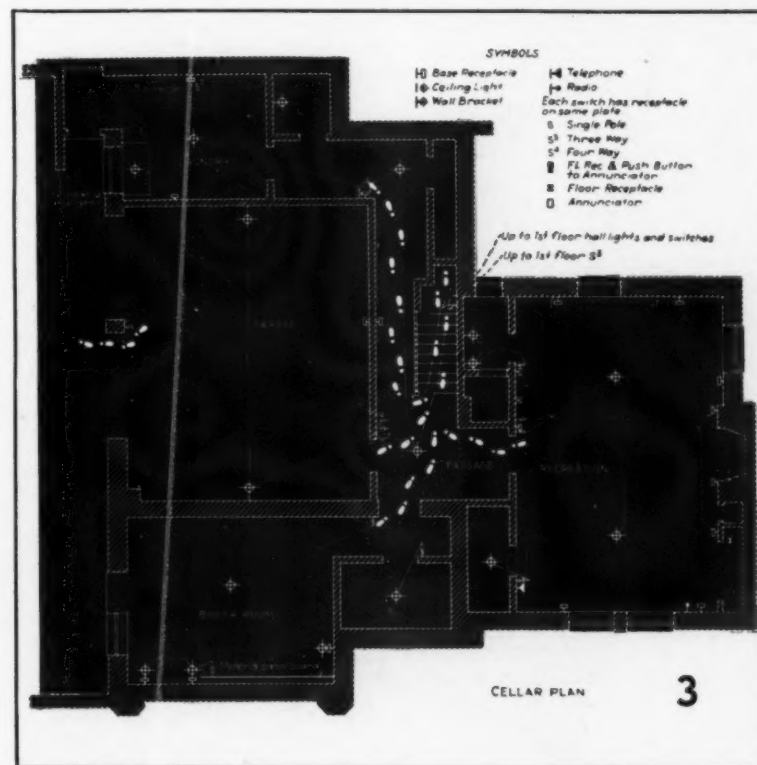
3

BASEMENTS ARE BUSY—So switches are set so light may be flashed on, whether you come down the main stairs or from the garage, laundry or recreation room. A lighted path everywhere.



beth, N. J. It was so planned that the occupants can go about all parts of the house at night, without stumbling over furniture to reach a switch. Closets are lighted automatically by door switches. Convenient receptacles are combined with switch outlets at the entrance of each major room, so that the vacuum cleaner can be connected without moving chairs or other furniture in order to plug into a base board outlet.

To provide space for putting in other conductors, should the owner desire additional capacity later on, 3-in. electrical metallic tubing was used throughout. In all, 210 outlets were installed, 33 branch circuits, an electric kitchen and an underground service of No. 2 conductors. And while the house is relatively small it required 2½ miles of wire and about 6500 ft. of 4½-in. and 3-in. electrical metallic tubing to do the job. Bell and telephone wiring also was run in metal raceways. The complete wiring, not including the lighting equipment, amounted to 7½ per cent of the total cost of the house.



Saving Shop Time

WITH

T A G S



RECEIVING REPORT

Job No. _____

R.R. No. _____

Received from _____

Address _____

Via _____ Date _____

Prepaid—Collect _____ Shipped _____ Unpacked _____

Insured _____

Condition as received _____

A.C.—D.C. EQUIPMENT

Make _____

Serial No. _____

Type _____

H.P.—Kw _____

Speed _____

Beam—Balls _____

Pulley—Gear _____

Additional Material _____

Parts Missing _____

Apparatus _____

Model No. _____

Volts _____

Winding _____

Terminal Box _____

BILLING AND ENGINEER INSTRUCTIONS



Numbered Parts and Totoloxe

Match-Marks Pullola

WHEN motors are routed through a modern service shop for reconditioning, they quickly become just so many separate parts. Each takes its place in a process of departmentalized production. But by the time windings are designed and installed, motor parts often find queer hiding places, and the final round-up of scattered parts is often a source of customer complaints and unnecessary labor cost unless a system of quick identification is maintained.

To check-mate such troubles the Electrical Installation Co., of Cambridge, Mass., puts in a little extra work on identification right at the start. As a result, production goes on with orderly, uninterrupted schedule and without a periodic treasure hunt for stray parts.

Before a motor job is released for work in this shop, a set of white identification tags is prepared. Each tag bears a bold set of stamped numerals that represent the job number. One tag accompanies the stator through the stripping, coil winding, and subsequent departments. The rotor, end frames, base or slide rails, and other major parts bear similar identification from the time of dis-assembly until they again re-

e
S

This Cambridge motor service shop prevents costly delays and errors by this simple method of identifying all parts. They net extra profits month by month that some shops lose.

Tote Boxes and Reassembly Dollars In The Till

set the assembled machine. In the meantime a green master tag, which bears the job number and a brief identification of the equipment, is kept with the "tote box" or tray which contains all small parts such as bolts, nuts, oil plugs, shaft keys.

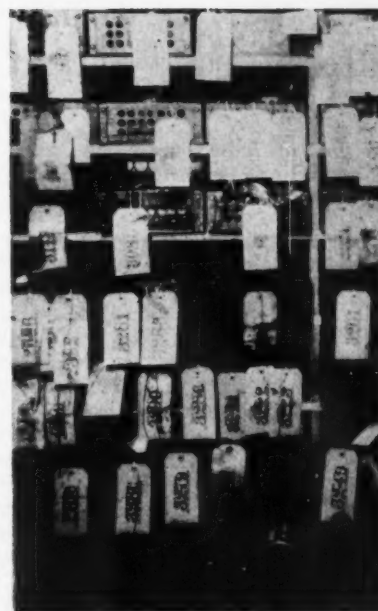
This relatively simple procedure requires only a few moments in the beginning, for stamping a series of job numbers on four or more white tags. Thereafter the various parts of each motor are "finger printed" so that no memory experts need to be kept on a busy shop payroll. It is possible to pick a certain customer's 10 h.p. stator from two or more in the shop of that size and make. If it is to have an extra dip and bake, there is no guesswork, because the shop order bearing that tag number includes these special instructions. Moreover, when the assembler gets a rush order for shipment, the numbered tags show him which rotor, end frames, pulley, base and tote box parts belong together.

There is also a foolproof method to "match-mark" incoming motors by countersunk drillings before disassembly. These drillings identify the original end frame positions, the relation of stator leads to the base or slide rails, the proper drive side

of the motor, and whether the assembly is to be for standard, side-wall or inverted operation. When the finished motor parts arrive at the assembly benches, these match-markings stand out clearly, and the customer's motor goes back assembled exactly as it was sent away.

Good general housekeeping also contributes to the success of this system. Since there are tags on all the major parts of every motor, each department concerns itself only with the pieces actually to be worked on. It is not necessary to look after other parts and move them along to the next man. Once a motor is taken down, items that need no work can be set aside for the assembler. The main object is to leave no parts cluttering any department excepting those needed there for production reasons.

It is never difficult, therefore, to locate any group of parts that constitute one motor, through making a quick check up at the right departments, and so the customer receives the same equipment that was sent in for repairs. There is no annoyance over the lack of a base or pulley that still lays somewhere in the service shop for want of identification.



NO. 1. "MATCH MARKS"—Mistakes in assembly are avoided by countersunk drillings that show how end-frames, slide rails and base were received from the customer.

NO. 2. RECEIVING REPORT—Here the job is recorded and instructions are given in brief form.

NO. 3. AWAITING ASSEMBLY—These plainly tagged motor parts are quickly identified when the finished stator comes along.

NO. 4. TAGS ARE CHEAP—So they use enough to mark each part. The green master tag for the tote box carries the job description.

NO. 5. FOR SMALL PARTS—Every steel tray or tote box has its tag carrying the job number.

Selling UP

Here are eight little stories from life that show that it is worth the trouble to have something to talk about when you go to see a customer. For though it is hard to interest people in wiring, it is easy to make them want some of the benefits that wiring offers. Circuit breakers right now offer one of these talking points that sell jobs up.

MANY contractors about the country are making hay with small circuit breakers. Recent examples show that there is another talking point that can be used to give interest to the idea of better wiring, and more adequate wiring for the man and woman who are building or modernizing a house.

It is hard to talk about wiring in the abstract. But it is easy to talk specific features of convenience and safety. And the contractor who makes a practice of it eats more pie. The trick is to use the talking points that are at hand and make a habit of using them on easy jobs.

As a matter of fact, it was the same way when the safety switch came along, a quarter of a century ago.

From the early days of wiring, contractors had been installing open knife switches and they looked all right. But on the crest of the safety movement, with wiring enclosed in rigid conduit, someone pointed out that switches ought to be enclosed as well. The safety switch resulted and it was used for years to sell up the job. A man could hold it in his hand and slap it. He could show it to a customer. It looked safe. It made safety look desirable and it did a lot to help the contractor improve prevailing standards. It brought him better and more profitable jobs.

But now for years, safety entrance switches have all been pretty much alike. To the contractor they are a standard article and to the customer just the familiar black box, he has always seen, where the wires come in. The small circuit breaker for residence use, however, is something else. There is an idea in it. It gives you convenience, time saving, and safety to talk about. All are strong human appeals. Also, you

can flip the handles and hear them click, and because all the world loves gadgets, it makes powerful sales talk.

Here are a few cases reported recently—

1. A manufacturer's salesman went out with a skeptical contractor to a home he was wiring. As they went in a woman came out and went next door.

"Who's that?" asked the salesman. "The owner," said the contractor. "Let's follow her up."

They did and called her to the door, told the story. They explained that it would add to her comfort and safety.

"How much?" says she.

"Four dollars," sezze, "But the important point is—etc."

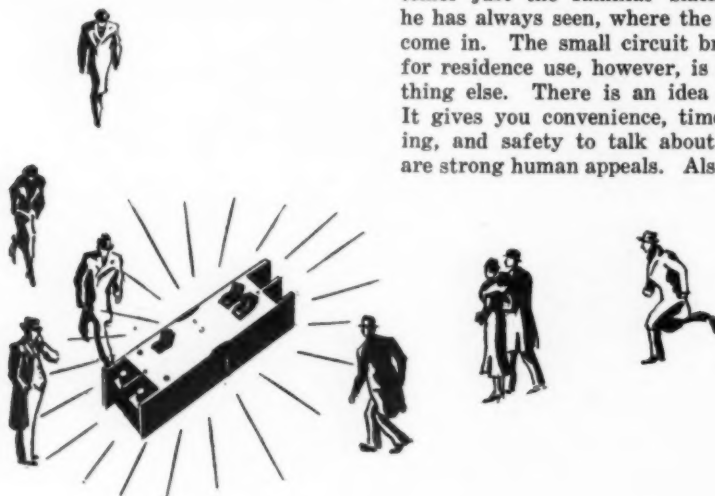
"I want it put in" she said, after she had turned it over in her mind. And then the friend whom she was calling on, spoke up—

"How about my house? I want one too."

2. A Wisconsin contractor writes—

"I decided to sell breakers and tried it on my next job. By simply showing the customer the breaker and explaining what I believed it would do for him, I had no difficulty in selling the installation and at a profit."

But it would have meant a wiring job for her and cost at least \$25—and that was that. But since then that contractor has put breakers in several more jobs and given better



A Wiring Job

How Contractors are Making Money

By Talking Circuit Breakers



service and made an added profit. He saw it could be done.

3. An Illinois contractor says—

"I was very doubtful whether I could sell the circuit breaker. I tried it on an elderly gentleman who depends upon his daughter for decisions. She is a school teacher and somewhat timid. The safety of the breaker appealed to her, as well as the convenience, and the idea won me the job which up to then had been a matter of cold price. She has shown the breaker to many friends and I have sold many more.

"The power company is enthusiastic and the local inspector has complimented me on these jobs. And I am only a curbstone contractor." It shows what can be done.

4. From Missouri another contractor writes that he secured a contract on 17 four-room bungalows and then took the speculative builder into a corner with a circuit breaker

and showed how it offered him a talking point in selling his houses. He sold him 17 six-circuit breakers and while he had him, landed him for an electric water heater in each house. It netted \$7 more on each wiring job plus a commission on the water heater.

5. A Georgia contractor had ten houses to wire in a mill village. The idea struck him and he called the electrical engineer of the mill on the phone and told his story. The mill men saw it in terms of safety and maintenance and got the extra expense approved. And that mill is going to build 190 more tenant houses.

Here again it made a talking point—safety and maintenance, less need for company inspections to see that all is well. It got them off the price defensive and set them to wanting something.

6. A New York state contractor was figuring on a project for 350 houses to be built by a large manufacturing company and sold on easy terms to employees. Naturally price loomed big. But this man talked breakers and they have been standardized for the entire development and are now in the first eight houses being built.

7. An Indiana contractor took a breaker in to show it to an architect, for whom he had just figured on a new home. As he came in, the architect called out.

"You're high."

"I expected to be," the contractor

said. "But what I have figured on is worth the difference."

He placed a breaker on the desk as he spoke. The architect was interested at once, examined it, flipped the handles, got the story and asked—

"How much will it cost me to use one of these?"

"Five dollars more than the bid."

"Well" he said. "This is the first time a contractor has suggested using a better grade of equipment to put the price up. The job is yours."

8. In another Indiana case, a contractor finished a job and took his tools out to his car and got in, ready to leave. But the owner followed him to ask about something and noticed a breaker on the seat.

"What's that?" he asked.

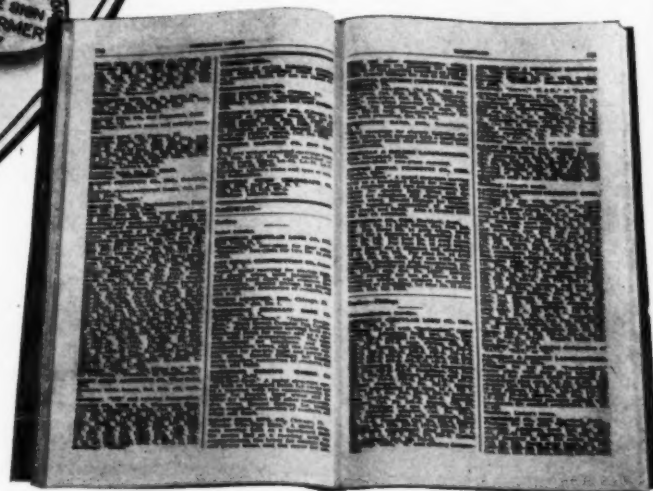
The contractor explained and the customer wanted one. So he took out the material he had just installed and put in a breaker for an additional \$13.50. Now he speaks first, he says, and breakers are getting him better jobs.

Selling does it. And selling means anything that gets the customer's mind off what he does not want to pay and onto what he does want to buy. Breakers are just an example, but a timely one right now. They introduce human interest into a discussion of wiring. They center the customer's mind on personal advantages and they become more important considerations than the expense.

The Approved

By H. B. Smith

Associate Electrical Engineer
Underwriters' Laboratories, Inc.,
New York, N. Y.



LABEL SERVICE—A few of the many labels authorized by Underwriters Laboratories and pasted on the product.

THE LIST—This book of all approved materials and devices is the greatest catalog of electrical equipment in the world.

SINCE the electrical contractor and the plant electrician and the inspector are so constantly checking equipment to see if it is "approved", it may be interesting to tell what has been done to make it easy for them to find this out. After all, it would do no good for Underwriters Laboratories to test materials and devices if these products were not adequately marked and conveniently catalogued for the user.

When manufacturers come with armored cable, conduit, outlet boxes, panelboards, switches, wires or something else, therefore, and formally

submit them for approval, a number of things happen. The product is examined with full consideration for its intended use and its installation in accordance with the rules of the National Electrical Code. Also, from the contractor's point of view, the product must be capable of being installed readily in the intended manner. And from the inspector's point of view, it must be so marked that it can be identified readily when installed.

If any features are found which are not acceptable, the manufacturer is so advised and given an oppor-

tunity to make any necessary corrections. Then when changes have been made, or if the product was originally such that no changes were necessary, the device or material is ready to be listed.

At once, a card report is issued. And as a manufacturer gets listings of a number of devices in the same classification, the listing card is made to include all such items. It may grow to the point where two or more cards are necessary—this condition being quite common in classifications such as outlet boxes and enclosed switches. In the aggregate,

Electrical Contracting, February 1937

List"

AND

How To Use It

for all classifications, there are now approximately 5500 such listing cards in the complete file—each one subject to revision at any time in order to keep it up to date.

But perhaps Underwriters' Laboratories, is best known to contractors and inspectors by its published "List of Inspected Electrical Appliances", the greatest catalog of electrical equipment in the world. This green-covered book of nearly 300 pages contains so many listed items that no accurate check of their number is feasible. Considering all the types, styles, ratings, wire sizes, etc., which are represented, however, it is estimated that well over a quarter of a million items are included. The "List" is issued in May of each year, a condensed statement of all the listed items on the cards previously mentioned. A supplement is issued each November containing all items listed since the main volume was published in May.

This published List of Inspected Electrical Appliances is a reproduction in miniature of the complete file of listing cards.

Every item in the book, however, is listed either under Reexamination Service or Label Service. This indicates the kind of "follow-up" or inspection that is maintained by the Laboratories to insure that approved products continue to be made in

Electrical Contracting, February 1937

compliance with requirements. No distinction is made between the two as far as listing is concerned. But the original examination and test work is only a part of the program of listing electrical equipment. The subsequent inspection work — the policing of approval—is particularly essential.

The Label Service applies generally to products whose quality or

acceptability may be affected appreciably by workmanship, and involves frequent—sometimes continuous—inspection at the factory. The Reexamination Service applies to products which are assembled largely from die or tool-made parts and which require inspection only once or twice each year. Accordingly, materials such as armored cable,

(Continued on page 90)

Guide No. 380 E6. November 8, 1932—Laboratories' File E17965.

Empire Engineering Corporation,
Newburyport, Conn.
Service Entrance Cable Fittings.

Connectors:
Angle type malleable iron, having steel or malleable iron ring with coiled steel spring having a rubber core for gripping the armor of service entrance cable, Type ECT, Cat. No. 1729.
Straight type, steel having a steel or malleable iron ring with coiled steel spring having a rubber core for gripping the armor of service entrance cable, Type COY, Cat. No. 1718.
Service entrance fittings. Cast metal outlet fittings having composition bushing with separate hole for each conductor and a steel or malleable iron ring with coiled steel spring having a rubber core for gripping the armor of service entrance cable, Type FEC, Cat. No. 1786.

Maximum In.	Inside Diam. of Grip	Minimum In.
1-3/32		11/16

Marking: Lister's name and type designation.

Listed—Reexamination Service.

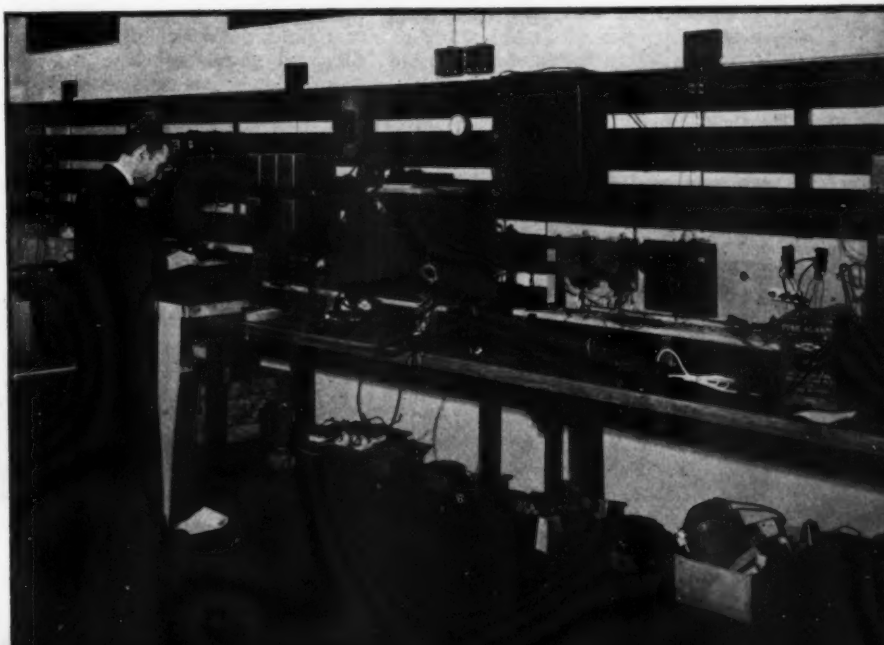
See description of Reexamination
eral Information Card filed ☒ Service on guide card, also Gen-
back of guide card.

This card replaces E17965, dated Oct. 21, 1932.
This card is issued by Underwriters' Laboratories.

CARD REPORT—Every approved device is first O.K.'d by the issue of a card like this.

The Second in a Series Of Practical Talks On the Testing and Listing Of Approved Electrical Devices

CONTINUALLY TESTING—Behind the list and the labels stand the engineers in the Laboratories who test and test.





TWELVE

Lighting

WITH a little ingenuity there are innumerable ways in which lighting can be used in the store interior and show window to make the display command attention and to convey an impressive sales story. Here are a few suggestions, done in sketches, to make it easy for the contractor to install them or adapt them.

The underlying idea is that it is not necessary to work with lamps and fixtures alone. Distinctive and efficient lighting can often be obtained by a bit of carpenter and paint work. It is often as desirable to change the store for the lighting as to change the lighting for the store and no more expensive.

1. A false ceiling or overhead shelf can be constructed with glass lens plates set in through which the light pours down with even distribution. This shelf may be of any size or shape desired to give a decorative effect. It may cover the counters only or the tables or most of the store. The edges may be treated artistically so that they lend character to the store. Trough units on top the display cases and illuminated signs may be also used.

2. A low narrow shelf ceiling may be built out in front of the wall cases to extend over the counter, with lens insets, a flood lighted ceiling and a silhouette sign.

3. A vertical band may be installed with a continuous cornice panel lighting the wall cabinets, counters and the wall above the cases, as well as providing for plenty of general lighting.

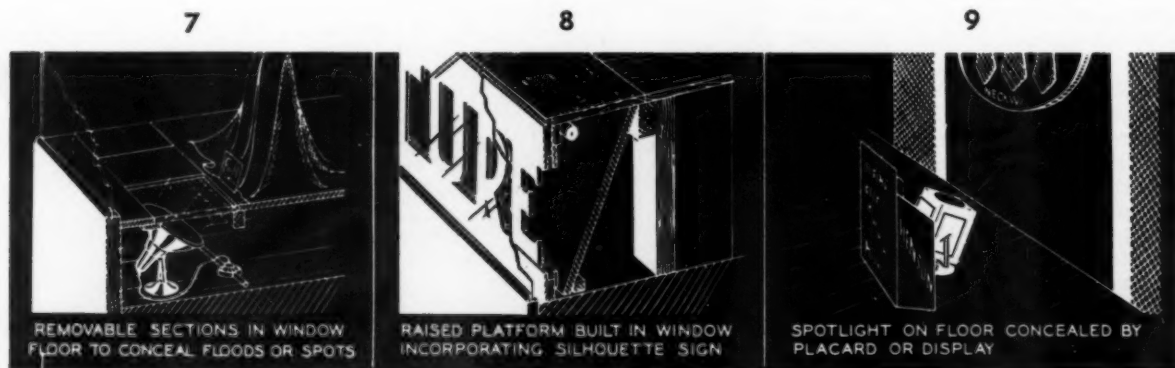
4. A pendant structure may be built over a counter or serving bar to provide a transparency sign, illumination for the counter and good back lighting toward the wall.

5. A simple pendant band may be equipped with a continuous trough unit providing indirect general lighting, flood lighting toward the wall cases and lens insets to illuminate the counter.

6. A special metal trough can be installed as part of the decorative scheme, following the layout of display cases, and provide indirect general illumination.

These six arrangements merely suggest the possibilities for setting the stage for store illumination. And the same kind of opportunities present themselves in window lighting.

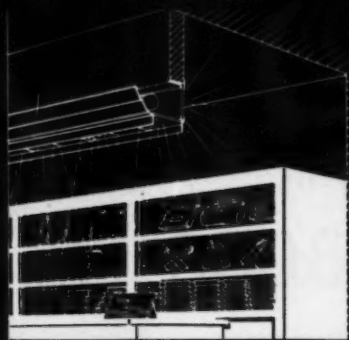
7. The window floor may be constructed with removable sections, similar to "traps" on the theatre stage. Any of the sections can then be removed and a spotlight placed below to brilliantly illuminate a part of the display at close range. A square of stippled glass or a section of metal louvers can be set in the opening to conceal the reflector.





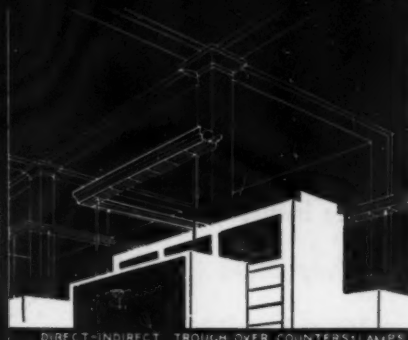
STRUCTURE ABOVE SERVICE COUNTER WITH STIP-
PLED GLASS PANELS BELOW, OPAL PANELS AT BACK
AND LUMINOUS SIGN IN FRONT

4



TROUGH UNIT COMBINING GLASS LENS PLATES
OVER COUNTER, LUMINOUS OPAL PANEL LIGHTING
WALL CABINETS, AND GENERAL LIGHTING COVE

5



DIRECT-INDIRECT TROUGH OVER COUNTERS; LAMPS
CONCEALED BY LOUVERS PROVIDE HIGH INTENSITY
LIGHT ON MERCHANDISE AND INDIRECT GENERAL IL-
LUMINATION FOR STORE

6

By Dean M. Warren

*General Electric Company
Nela Park Engineering Dept., Cleveland*

Suggestions

**Some Practical Ideas to Use
With Store Displays and Windows
Where a Bit of Staging Brings Distinction.**

8. It is common practice also to build platforms in windows where small articles are shown, to bring the merchandise closer to the eye level. An attractive silhouette sign can easily be incorporated in this platform, by constructing a slotted frame to hold cutout letters and concealed white or colored Mazda Lumiline lamps, lighting a white, sloping background. A removable floor panel provides for relamping.

9. Spotlights or floodlights, set on the floor, focussed at close range on the featured part of the display will produce a brightly lighted high spot in the composition that is sure to attract attention. The equipment can be concealed behind placards.

10. Small illuminated niches or cubicles built into background or set-piece will add interest to the window and draw attention to small articles without detracting attention

from the principal display. The top and left hand side could be formed of opal glass to diffuse the light from lamps concealed as shown. The decorative border strips might be of colored translucent glass.

11. Sections of portable trough reflector help in arranging special display lighting. Where the center of interest is on the background, these troughs may be hidden behind merchandise on the floor, concealed in a vertical position at the sides, or suspended from above.

12. Luminous backgrounds offer unusual opportunities for artistic and attention-getting effects. A translucent surface can be formed of muslin, oil soaked, tracing cloth or thin paper, stretched on a wood frame and lighted by trough reflectors. The decorations or signs can be either painted in translucent color on this surface or made in the form of cutouts silhouetted in front.

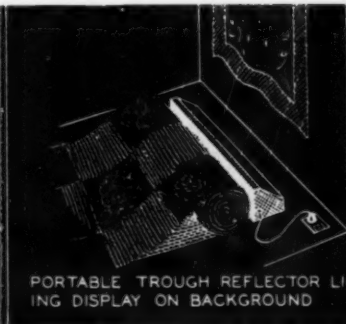
In other words, store lighting should be designed for display as well as for illumination and the test is the effect upon the customer. Any such idea the contractor can contribute to obtain distinction in the installation is to his advantage.

10



SMALL DISPLAY NICHES BUILT IN
WINDOW BACKGROUND

11



PORTABLE TROUGH REFLECTOR LIGHT-
ING DISPLAY ON BACKGROUND

12



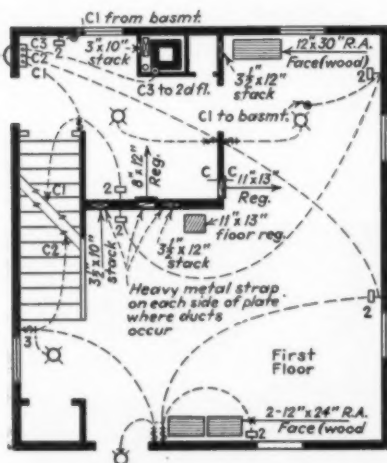
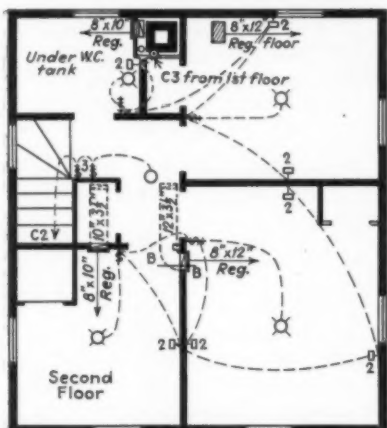
TRANSLUCENT BACKGROUND LIGHTED BY
TROUGH REFLECTOR

Lumber Industry
Launches Drive
Electrical Contractors
Can Tie In Locally In 1000 Towns

3000 Small Houses TO BOOST THE BOOM



HOUSE "E"—
with lot
graded will
cost complete
\$4120.



FLOOR PLANS OF HOUSE E showing electrical system. House B (right) will cost \$3765 all complete.

LUMBER dealers throughout the country are going to build 3000 small frame houses. They want to demonstrate that low income families can buy comfortable modern homes and enjoy the advantages of a plot of ground that is their own. Standard plans and specifications have been worked out for these homes. Model B will cost \$2500, Model D \$2450, and Model E \$2900. Other designs will follow, ranging between \$3000 and \$4500.

This drive has been launched by the National Lumber Manufacturers Association. The National Lumber Dealers Association is cooperating. The Federal Housing Administration will do the financing. The plan is to have the 3000 homes completed by May first and sold to men and women in the salary class for \$1200

to \$2500, financed 20 per cent cash and as little as \$20 a month.

With a shortage of two million homes in the United States today, the lumber people believe there is a vast need for small homes of this type. This drive is intended to demonstrate that they can be built at the price.

Simple specifications for the electrical work have been reviewed by the National Electrical Contractors Association. In a single house, of course, the job is small. But there is an opportunity for any contractor to work with his local lumber dealer. Handled together it can be made worth while. If your lumber dealer does not know the details, tell him to write to his National Lumber Dealers Association at 1337 Connecticut Avenue, Washington, D. C.





**"If you want to see a
Real Range Switch
—take a look at this!"**

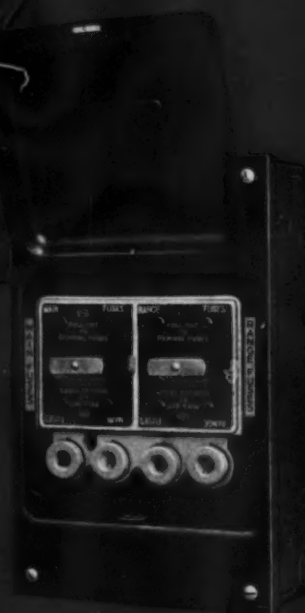
**The Cutler-Hammer
Bulletin 433AH15
Range Switch**

with

**1 REMOVABLE IN-
TERIOR**—easy access
disconnecting. Cut wiring
time.



**2 NON-INTER-
CHANGEABLE
FULL-OUTS.** Pre-
vents placing lighter
fused Range Pull-Out
in Main Circuit.



Since its introduction early in 1936, the Cutler-Hammer Range Switch has met with universal acceptance. Contractors, utilities and wholesalers everywhere have been enthused over the advanced design of this switch. . . . The contractor because of the many attractive features which reduce wiring and installation time; the utility because of the care taken to assure safety and reduced service calls; and the wholesaler because of the enthusiasm from his trade which has resulted in a definitely marked upswing in C-H Range Switch Sales.

You may not rate those features in the order shown, but the *important* thing is, a first-hand examination of this switch will demonstrate how conclusively it meets the needs of today. Your regular Cutler-Hammer wholesaler will gladly demonstrate. CUTLER-HAMMER, Inc., Pioneer Manufacturers of Electric Control Apparatus, 1306 St. Paul Ave., Milwaukee, Wis.

And 9 Other Important Features

- 3** Solderless connectors for use with solder spreader or solderless wrench.
- 4** Solid porcelain barriers between terminals prevent shorts.
- 5** Fuse test holes; you don't interrupt service.
- 6** C-H mar-proof black on tough, durable case.
- 7** Ample space for wires.
- 8** Plenty of knockouts (water twist-out on top if wanted).
- 9** 60-amp. rating main and range switches; 4 branch circuits.
- 10** 60-amp. tap for extra distribution panel or water heater.
- 11** Easy-to-use 30-amp. terminals.





Again

There is

Again we say . . . **There is no substitute**

A TRADEMARK is only as good as the product upon which it appears. Its fame compels maintenance of the qualities that earned it. » » The phenomenal success Safecote Electrical Conductors are enjoying, is a direct result of performance on the job; it is the direct result of the rigid maintenance of Safecote standards by the eighteen leading wire manufacturers who are authorized to make and sell Safecote Electrical Conductors. » » The Safecote laboratories guard these standards: **FLAME RETARDING**, will not carry flame; **MOISTURE RESISTING**, hermetically sealed against such destructive agents as moisture, light, and air; **FISHABLE, SLICK FINISH**, smooth, slippery finish, easy to pull through conduits. More wire possible in a given size conduit.

**BUY TEST
BY LEAD**

American Comp
American Con
The Company
Bishop Corpor
Clifford
Columbia Comp
Crescent & Co
Generation
General

UMI

we say...

IS no substitute for Confidence

Safecote ★ ★ **ELECTRICAL**

CONDUCTORS



U. S. LETTERS PATENT NUMBERS:
1,635,829 1,772,436 1,765,000
1,798,486 1,410,790 1,536,549

OTHER PATENTS PENDING

**INSIST UPON GENUINE SAFECOTE
FOR YOUR PROTECTION**

**BUT TESTED TO SAFECOTE STANDARDS
BY LEADING WIRE MANUFACTURERS**

Ames Company
Armstrong Company
The Company
Bishop Corporation
Cliff Company
Cotton Company
Crawford & Cable Co.
Generation
Germany

Habirshaw Cable & Wire Corporation
Hazard Insulated Wire Works Div. Okonite Co.
National Electric Products Corporation
Paranite Wire & Cable Company
Providence Insulated Wire Company
John A. Roebling's Sons Company
Simplex Wire & Cable Company
Triangle Conduit & Cable Co., Inc.
United States Rubber Products, Inc.

**SAFECOTE LABORATORIES ARE AT YOUR DISPOSAL
SAFECOTE PERFORMANCE SPECIFICATIONS UPON REQUEST**

**GEORGE C. RICHARDS, LICENSOR'S AGENT
155 EAST 44th STREET, NEW YORK CITY**

● The maker of any portable tool or piece of equipment puts his best engineering design and manufacturing ability into his product. But a poor portable cord could destroy his work. Where severe operating conditions exist, only the best portable cords should be used. The maker and the user of portable equipment will find a Hazard Cord that answers all severe operating conditions.

HAZACORD

ALL RUBBER
PORTABLE CORDS

and CABLES
*meet all conditions
of Service*

HAZACORD

An "armor" of tough 60% rubber, mold cured, protects the separately insulated conductors from injury. The jacket formula insures long life, even under conditions of sunlight, bad weather, chemical fumes and other destructive influences.

In two cases recently investigated, exceedingly hard usage resulted in an average cord life of *one day*. HAZACORD was adopted and is now delivering more than *60 days* service.

HAZAPRENE CORD

Oil Resisting Rubber Cord. In place of the usual 60% rubber jacket, HAZAPRENE CORD has a tough protective jacket of the widely known Neoprene synthetic rubber which does not soften and swell in oil or grease like a rubber jacket. Costs only a little more but gives far greater service where the most severe conditions exist.

HAZARD PERMEX Lamp Cord

Type POSJ. This rubber sheathed parallel lamp cord will stand punishment. Each conductor is separately insulated and there is a colored rubber jacket over them, with a web of rubber between which acts as a cushion. 30% rubber on the conductors and tough 60% jacket. Furnished in four attractive colors, Brown, Black, Ivory and Green.

HAZARD FIGURE 8 Lamp Cord

Type POSJ Spec. A parallel two-conductor flexible lamp cord, with single rubber jacket, and with "hour glass" or "Figure 8" cross section. A knife nick at the end and the conductors may be separated, leaving full insulation on each. Low in cost, handy to work, tough and durable. Also in four colors, Brown, Black, Ivory and Green.

HAZARD INSULATED WIRE WORKS

Division of The Okonite Company
WORKS: WILKES-BARRE, PA.

Sales Offices:

New York	Chicago	Philadelphia
Buffalo	Boston	Los Angeles
Detroit	San Francisco	Atlanta
Dallas	Pittsburgh	Seattle
		Washington



Methods of other CONTRACTORS

CONVERSION TABLE MINUTES-TO-DECIMAL-HOURS

Service shops and contractors will find this table useful in time studies of labor operations, or in preparing estimates from labor units that are expressed in hours and minutes.

1	.017	21	.35	41	.684
2	.034	22	.368	42	.70
3	.05	23	.384	43	.717
4	.067	24	.40	44	.734
5	.084	25	.417	45	.75
6	.10	26	.434	46	.767
7	.117	27	.45	47	.784
8	.135	28	.467	48	.80
9	.15	29	.484	49	.817
10	.167	30	.50	50	.834
11	.184	31	.517	51	.85
12	.20	32	.534	52	.867
13	.217	33	.55	53	.884
14	.232	34	.567	54	.90
15	.25	35	.584	55	.917
16	.267	36	.60	56	.934
17	.284	37	.617	57	.95
18	.30	38	.634	58	.967
19	.317	39	.65	59	.984
20	.334	40	.667	60	1.00

FLOOR-ROUTED TRANSFORMER WIRING

Absence of superstructures for primary and secondary busses is a feature of a 11,000-volt transformer station recently installed by the Pacific Electric Motor Co. of Oakland, Calif., for a new food processing plant. Three 200 kva. transformers are mounted on a concrete mat and base in the rear of Standard Brands of California, also in Oakland, with

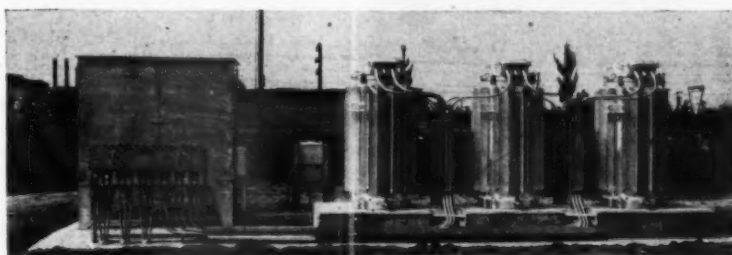
the primary and secondary conductors routed exposed in the webs of channel iron members.

The primary service conductors were installed underground from the street pole and air disconnects to a main oil-immersed disconnecting switch that is located beside the primary metering and terminal cabinet. The 440-volt secondary conductors that supply the building were run underground from a weatherproof secondary terminal box. All primary and secondary conductors, between the transformers and their terminal boxes, are single lead-sheathed cables with wiped lead sleeves to exclude moisture and to provide a thoroughly bonded sheath for safety.



Primary Side—The cables from the main oil switch to the transformer are out of the way and easily replaced in case of trouble.

The arrangement of terminals in the metering cabinet and the secondary terminal box permits single-

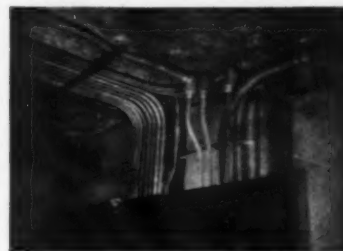


Secondary Side—Feeders to the building terminate in a plugging box before connecting to the 440-volt secondary leads of the transformer.

pole plugs and cables, arranged to cut out any one transformer, and connect the other two in delta. Any transformer may be easily removed from the group without hazard to the cables and without being obstructed by a superstructure. If a cable should become defective, it is easily replaced without seriously disturbing the other cables of the station layout.

HOME RUNS WITHOUT NOTCHED JOISTS

The frequent notching of joists was forbidden in a New Jersey home that was recently wired with electrical metallic tubing by the Dengler Liddy Burd Electrical Company of



Notching Avoided — Exposed tubing on basement ceiling connects riser runs and saves weakening joists.

Elizabeth. The roughing in layout therefore incorporated exposed circuit runs between the 24-circuit panelboard and various places on the basement ceiling where tubing was stubbed down from upper floors.

Threadless junction fittings were installed tight against the plastered basement ceilings at all stubs, in line with the exposed home runs.

Because all branch circuit raceways were specified to be not less than 3/4-in., the exposed installation method saved having to weaken the joists by notching, and also permitted the routing of the home runs in line with the majority of stubbed tubing. One gang of ten 3/4's was held tight to the ceiling with a single iron hanger-bar.

PREVENTS INSULATION FIRES

To reduce the possibility of insulation fire hazards in the various junction boxes, pull boxes and panelboard gutters of a modernized brewery in Orange, N. J., all accessible conductors were covered with one overlapping layer of 1 1/2-in. asbestos tape from their point of entrance to such boxes. This pre-



Each package contains ten No. 8 rolls of the same guaranteed yardage as in the regular individually cartoned Tape. No other size is packed in this manner.

PARCHMENT DISC BETWEEN EACH ROLL

Industrial Users *like* this Shop Package IT SAVES THEM MONEY!

• The popularity of the Jumbo Shop Package of DUTCH BRAND, the "Extra Service" Friction Tape, is growing rapidly. It's the most practical package ever designed for the commercial user.

With shop men, foil wrapped and individually cartoned rolls are unnecessary and wasteful. The Jumbo method of packing saves foil, cartons and labor which savings are passed on to the user in the form of lower prices. Industrial buyers know this and are demanding the economical Jumbo Package. Ask your jobber how much you can save, or write us.

DUTCH BRAND Friction Tape, Rubber Tape and Soldering Paste are sold by electrical jobbers everywhere.



VAN CLEEF BROS. Est. 1910
Manufacturers

Woodlawn Ave., 77th to 78th Sts.
Chicago, U. S. A.

Standard Packages

The Nos. 3, 4, 2 and 1 sizes are all available in the well known orange and blue individual and display cartons and metal counter dispensers for retail sale.



DUTCH BRAND Rubber Insulating Tape

Fuses instantly without heat. Molds into one solid piece. It's t-r-e-t-e-h-s without breaking because it contains more live, new rubber. Approved by Underwriters Laboratories.



Methods of other CONTRACTORS

[FROM PAGE 27]

caution was taken to safeguard igniting the insulation of other conductors should ever a loose splice or chafed conductor produce a harmful arc. In making up these fire retard-

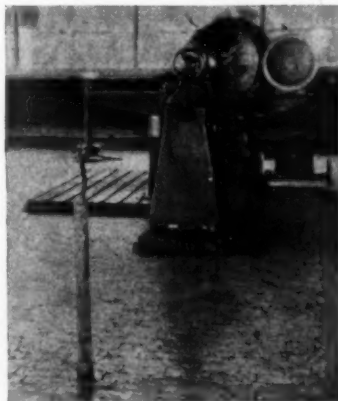


Fire Protection—Asbestos covering for massed conductors in boxes guards against ignited insulation.

ing outer coverings over a 30 p.c. para rubber insulated conductor system, the Edward J. White Company of Newark, N. J., applied a final coat of plastic asbestos filler.

GUARDS FOR WAITING CONDUCTORS

The ends of lead sheathed cable that are left to project from under-floor raceways for making future

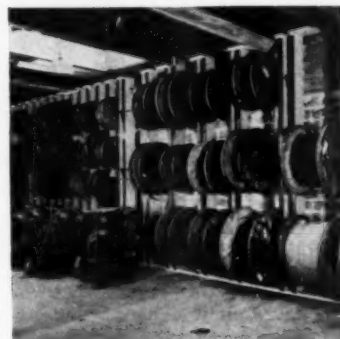


Cable Protection—Exposed ends of under floor runs made safe from mechanical injury.

motor connections are usually subjected to serious mechanical injury unless suitably guarded. In a machine shop at Chattanooga, Tenn., the Terrell Electric Company had a number of incompleting floor-stubbed motor runs which contained lead sheathed conductors. These were protected against injury pending the receipt of the motor, by attaching a temporary nipple to each piece of stubbed conduit, of sufficient length to enclose the extra conductor length. After a machine is set in place, these nipples may be removed and flexible steel conduit attached to complete the connection to the motor terminal junction box. The conductors were installed prior to the setting of all machinery in order to complete the connections at the power distribution panelboard. A 2-in. conduit containing three No. 2 conductors is shown in the foreground.

OUT-OF-THE-WAY CABLE REELS

The Pacific Electric Motor Company of Oakland, Calif., uses a rack that stores 70 cable reels of various

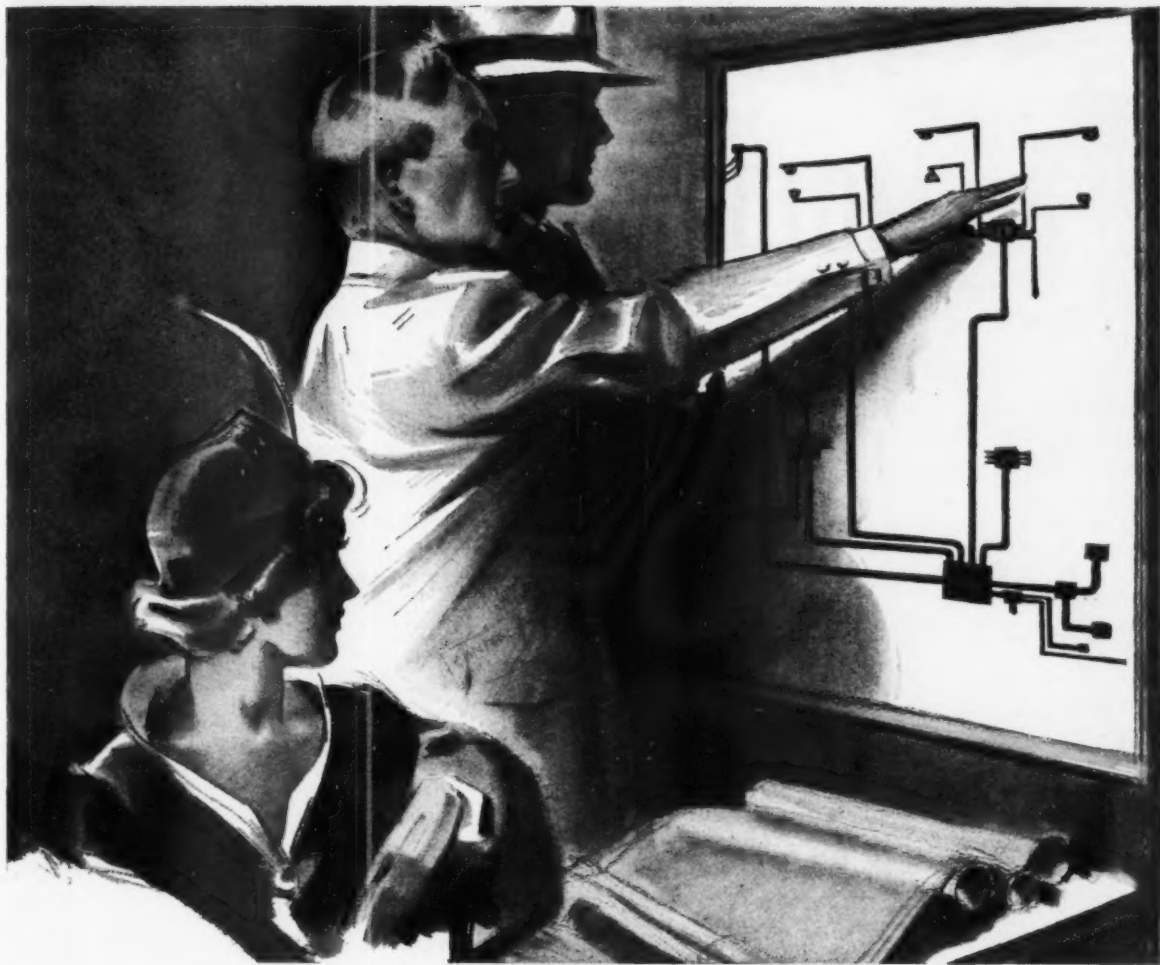


Space Saver—Heavy cable reels racked along the wall save floor space and make paying off easy.

sizes. It takes care of their large cables in a minimum floor area, yet keeps all sizes available for quickly cutting off any required lengths.

Vertical timbers which make up the rack were spaced at varying distances and secured to the ceiling joists and to a wood floor sill. The front edges of the vertical members were faced with flat iron strips to which are welded the brackets for supporting the reel spindles. Heavy reels are placed in position with a portable floor crane. With this arrangement, a large stock of feeder cable is readily accessible for rush industrial wiring jobs with a minimum amount of handling.

Electrical Contracting, February 1937



EVERYONE BENEFITS WHEN YOU USE G-E PLANNED WIRING★

Whether you're trying to sell a house wiring job to an architect, a contractor or a home owner, you'll have an easier time doing it if you talk about General Electric Planned Wiring—the G-E Radial Wiring System. Everyone concerned in any one of these sales will benefit.

The architect will benefit because his client will be pleased and because his reputation will be increased for far-sighted, modern work.

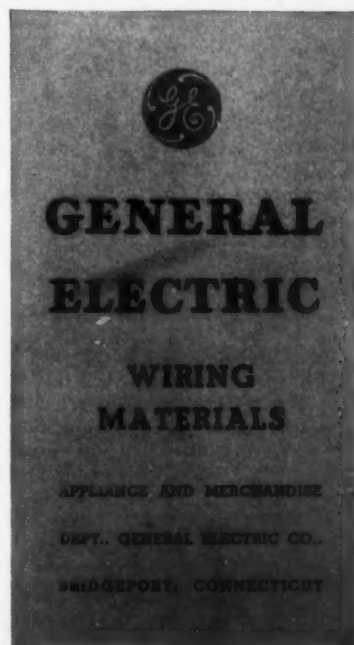
The building contractor will benefit because he will have added another selling feature to his house and because his reputation too will be enhanced.

The home owner will benefit because the wiring in his new home will make possible the use of all modern electrical equipment and lighting now and in the future.

And you, the electrical contractor, will benefit because the job will be adequate and will require quality materials. Therefore, you will be able to obtain a fair price, make a decent profit, and be free from cut-throat competition.

Consider the sales possibilities of this Planned Wiring and the profit possibilities. Determine now to take personal advantage of the modern trend to electrical living—a trend that requires adequate wiring—Planned Wiring. For full information about G-E Planned Wiring, the G-E Radial Wiring System, write to Section CDW-882, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

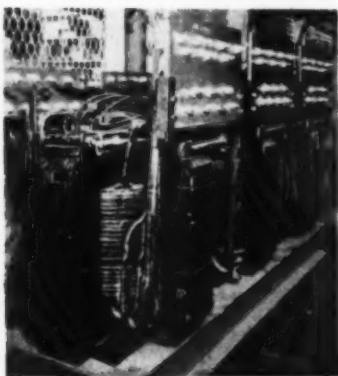
*G-E Radial Wiring System



Among the MOTOR SHOPS

EQUIPMENT FOR MULTI-VOLTAGE TESTS

These nearly completed 550-volt transformers are going to step up testing efficiencies for the Electrical Installation Co. of Cambridge, Mass. Re-designed for air-cooled duty from



Most Any Voltage—Testing switchboard with connections providing for a wide voltage range.

75 kva. oil-cooled cores, three units were mounted on a 6 ft. long and 3 ft. high I-beam rack. Leads are brought out to $\frac{1}{2}$ -in. natural bakelite terminal panels from which they will be bussed to the rear terminals of jack-plugs on the testing switchboard. From the face of the board it will be possible to obtain about 54 graduated voltages with jumper leads.

Beginning with 14-volt taps that are to provide a capacity of 50 kva., this outfit can be used intermittently for 300 kva. at 4550 volts or for 150 kva., continuous load at this maximum voltage. Rear panels are arranged with terminals for Y, Delta or Scott-connected primary, with taps for 15 p.c. below and above the normal voltage design of the winding.

The 14-volt connections of this transformer bank are to be used in some cases for partially preheating

stators and windings before impregnation. This preheating method is said to reduce by one-half the preheating time that is normally required when cold stators are placed in the baking oven.

CUT FOR STRIPPING

It took about ten minutes to strip the coils from this $\frac{1}{2}$ -h.p. 3 ph., 1725 r.p.m. Baldor motor in the service shop of McCarthy Bros. & Ford at Buffalo. A pair of snips was used to cut through the knuckle of each group of 33 No. 22 ga. wires. Because the windings were totally burned out on this motor, when it was sent in, they could be pulled out easily with a pair of pliers.

As each coil was cut, the ends were bent straight with their slot. As a result such remaining cell insulation as was not consumed, when the winding caught fire, slipped out easily with the old wire. This left



Quick Stripping—Snips cut small windings clean and make the job easy for removing old coils.

little stator cleaning labor to be done before the coils were installed.

ONE MAN RUNS BAKE SHOP

He does not bake and dip cakes in chocolate. But for dipping and bak-

ing all sizes of motors and coils, this young man has his own special fire-proof room at the Pacific Electric Motor Company, Oakland, Calif. No extra huskies are needed because a curved monorail brings the motor by overhead crane to the vat, and after impregnation, the operator places it in the baking oven.

Small motors and rotors may be placed in the portable "stow-away" oven which may be seen in the center background. It just fits under the drip apron or drain board to the left of the vat. The large oven with its counter-weighted vertical-slide door has a rugged truck which accommodates the large jobs. A rack which



No Helpers — Monorail brings motor to vat and into oven, easy and no accidents.

was attached to this truck provides hanger-bar ledges for small stators or sets of coils.

For draining the surplus varnish from sets of freshly dipped coils, there are some 20-odd substantial inserts on the wall above the varnish tank. These receive short lengths of pipe upon which the coils are suspended in the dipping process.

TOP-OF-BENCH BALANCER

When small rotors are placed on these sharp-edged parallel bars and permitted to roll, they are said to reveal any possible condition of rotor or armature unbalance. This balancing outfit was made by the Erie Electric Motor Repair Company, Inc., of Buffalo and is mounted upon a bench in the assembling department.

The horizontal bars are 15 in. long of $\frac{3}{4}$ -in. by $1\frac{1}{4}$ -in. steel. They are mounted in slots milled in the top ends of 2-in. by 6-in. steel posts. The four posts are drilled and tapped in the bottom, and have take-up cap-screws to make them secure at any

THE UNSEEN HAND

...that makes this installation COMPLETELY AUTOMATIC

It's profitable for you to have store managers sell your customers. One sure and easy way of adding new business is to sell them Sangamo Time-Switches.

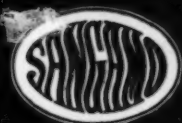
But . . . you must first point out how they can save the merits of evening lighting. And when you show them how the unseen hand takes care of this important job personally, regularly and automatically . . . your persuasion becomes persuading!

Sangamo Time-Switches are the best kind of "leaders" if you want new business and new customers.



ORECK'S

ORECK'S



SANGAMO ELECTRIC COMPANY **SPRINGFIELD ILLINOIS**



ENAMELKOTE GALVAKOTE ELECTRICTUBE HOTKOTE

You can't lose with a combination like this. These modern brands are the four aces of conduit and will prove winners in every deal. If you are not already using "Enamelkote," "Galvakote," "Hotkote" or "Electrictube" investigate this line and you will find your ace in the hole. Why not specify these finer brands on your next job.

**CLAYTON MARK
& CO.**

OPERA BUILDING
CHICAGO, ILL.

Among the MOTOR SHOPS

[FROM PAGE 30]

desired position on the slotted cast iron rails. The rail slots permit the parallel bars being adjusted as much as 15 in. apart.



Self Levelling—Level bars on top of bench reveal unevenly balanced condition of rotors or armatures.

This outfit is kept in a reasonably level position. When a rotor is rolled gently along the bars, it quickly indicates the "heavy" side. When this unbalance has been corrected, the rotor will roll along the bars to a dead stop without any evidence of sway or back roll.

SPECIAL SERVICE FOR OIL STATIONS

A new wrinkle in motor shop service has been started by the California Electric Works of San Diego, Calif. It offers to gas and oil service station operators, both independent and large companies, a complete mechanical and electrical service on pumps, compressors, motors, V-belts and pulleys, battery chargers, tanks, lifts and wiring. A special truck has been equipped with all tools and parts necessary to do a complete servicing job, manned by a former service station operator who knows the requirements of such service.

From the beginning this service has been popular and now several of the large oil companies have entered contracts for a regular maintenance service of their service station equipment. This includes the cleaning and polishing of lighting fixtures, replacement of lamps, as well as wiring and repairs, both mechanical and electrical to all equipment.

RECONDITIONING A HEAVYWEIGHT

Placing the large stator coils and inserting slot wedges for a 200-hp., 500-r.p.m., 2200-volt squirrel cage motor is heavy work. The Erie Electric Motor Repair Co., Inc., of Buffalo, recently did one of these jobs on the ground floor where there was plenty of elbow room.



Sitdown Winding—Heavy stators wound without cramping, by blocking into handy positions.

This stator could be rolled along the floor and blocked securely in place with timbers. This made it easy to keep the mechanic's work area on the bottom near the floor, without working upside down.

This stator was part of a direct-connected motor-generator set. The 150-kw, 125-v. d.c. generator of 1200 amp. rating appears at the right.

Complete Mechanical and Electrical Service Station Service

'CALEWO'
California
Electric Works Ltd.
424 8th Ave. - San Diego
Main 2145

After Regular Hours, Phone R. 0952

On

- Pumps
- Compressors
- Motors
- V-Belts & Pulleys
- Battery Chargers
- Tanks
- Lifts
- Wiring

Job Sticker—This label posted on all jobs done for gas stations, advertises a specialized service—Post-card reminders are also sent out.

Here's Another COLT-NOARK Protectit!

Two Pole Solid Neutral Protectit
... in attractive molded case.



New TWO POLE PROTECTIT
with Switching Neutral ...
in handsome molded case.



Yoke Mounted Single Pole Pro-
tectit ... for installation in
standard wall box or Handy box.

... These Smart Looking Auxiliary Circuit Breakers are Ready to Increase Your 1937 Profits

That job requiring a snappy looking, safe and efficient Auxiliary Circuit Breaker for the protection of small motors . . is just made to order for these New Colt-Noark Protectits. Furnished either with fixed ampere rating, or for interchangeable differently rated heaters. Protectits are compact, rugged and safe . . . and combine "on" and "off" switching with efficient overload protection. Install Protectits for protection of small motors on household appliances, machines, tools, oil burners and mechanical equipment.



Two Pole Protectits

The Two Pole Type "B" Protectits with either solid or switching neutral are available in 11 different ampere ratings, and the Type "BH" Protectits with either solid or switching neutral are adapted for any one of 20 differently rated heaters. These Protectits are designed for quick, easy installation directly on machines, tools and appliances, as well as in metal cabinets and on outlet box covers.

Yoke Mounted Protectits

The Single Pole Yoke Mounted Protectits are supplied with either fixed ampere rating or for interchangeable heaters . . . they are designed for installation in standard wall and Handy boxes. Can also be furnished complete in attractive cabinet with baked aluminum finish. Single gang covers for standard deep wall boxes and Handy boxes are available.

COLT'S PATENT FIRE ARMS MFG. CO., ELECTRICAL DIVISION HARTFORD, CONN.
H. B. Squires Co., Pacific Coast Representative

100 Years of Manu-
facturing Experience
is back of every Colt
Built Product

COLT-NOARK

SWITCHES - MOTOR STARTERS - FUSES

Boston
New York
Chicago
Philadelphia

For Better LIGHTING JOBS

When Lamps Begin to Break

by C. L. Dows
General Electric Company,
Nela Park Eng. Dept., Cleveland.

Shock and vibration are among the more difficult service problems affecting the performance of incandescent lamps. The trouble is primarily because there is no single

taints, lamp performance is affected only slightly and in some instances not at all.

This condition is found in certain mills or factories where the incandescent lamp is "dancing a jig." It might be expected to interfere appreciably with lamp performance; but does not due to the relatively high visible amplitude and low period of frequency of vibration.

Lamp manufacturers have done a lot of research and development work in the effort to design lamps which will more nearly meet these conditions. But a lamp designed for vibration may not necessarily be the most suitable for shock.

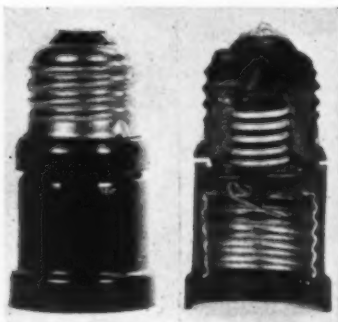
Curiously, a filament, the coils of which have a tendency to pull out or sag, gives a somewhat better life performance under vibration than one which does not sag. On the other hand, a filament with sagging characteristics is unsuited in lamps designed to withstand shock (and some types of vibration) and also in lamps for general lighting service.

So the 50-watt P-19 clear bulb

Suggestions for Overcoming Vibration

There are several ways in which unsatisfactory lamp performance, due to vibration and shock, may be attacked.

1. Take whatever steps are necessary to eliminate or reduce the causes of vibration at their source. For instance, the elimination of any unusual shock or vibration causes in the plant.
2. Make sure that the most suitable lamp be used for the particular service at hand.
3. Separate the power and lighting loads, wherever possible, and in the case of 230-volt installations change the circuits to 115 volts, whenever practicable, in order to gain the advantages of the lower voltage lamps.
4. Regardless of the socket voltage, the use of the next higher wattage lamp will often improve, if not eliminate, the difficulty from vibration or shock.
5. Make use of shock absorbing sockets or hangers which are specially designed to improve lamp performance under vibration and shock conditions.



Resists Vibration—The VR adapter, cures certain severe types of vibration.

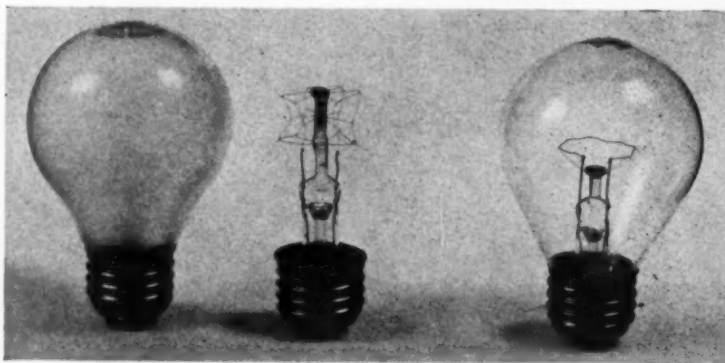
prescription which can be written and universally applied.

It is difficult to accurately define these two types of service or even to measure them in absolute terms of their effect on lamps. Vibration is a continuous tremor of rather high frequency. Shock is a more or less intermittent effect similar to that which occurs on a lamp for extension cord service. In actual service all sorts of combinations of vibration and shock may be found.

Generally speaking, the types of vibration most disastrous to the filament of an incandescent lamp are those involving high frequency and low amplitude. Cases have been noted in which no vibration was visible to the eye and where the frequency was so high that very rapid distortion of the filament reduced lamp life to a few days. On the other hand, sometimes where low frequency and high amplitude ob-

lamp for vibration service has a ring type filament with a sagging characteristic. The 50-watt A-19 inside frost bulb rough service lamp has a special filament construction with non-sagging characteristics.

Probably the most difficult vibration problems are found on 200 to 260-volt circuits, and for two reasons. First, these voltages are generally used in steel mills and found-



For Rough Stuff:—The 50-watt A-19 (left) for use where severe shocks occur—but not vibration—and its filament construction. The lamp on right is the 50-watt P-19, for high-frequency vibration. Not recommended for horizontal burning.



AND ELIMINATION OF FIRE HAZARD

Wind Motors with Deltabeston Asbestos-insulated Magnet Wire

Your customers like the superior performance of Deltabeston. They appreciate . . . and profit by . . . the added service of this Asbestos-insulated Magnet Wire.

For lasting reliability there is nothing like Deltabeston. Every motor wound with it will *hum its praises* . . . year after year.

Deltabeston is insulated with PURIFIED, FELTED Asbestos. This insulation is firm, tough, durable . . . will withstand pressure and resist abrasion. It is the ready choice of motor owners and operators because it eliminates fire hazards.

Boost your reputation and your profits by using Deltabeston. Use it on every rewinding job. Win the future business of your customers through its elimination of fire hazard, its long life and its above-average performance.

Send for complete information and samples of Deltabeston Magnet Wire. Write to Section Y-882, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut. Deltabeston Wire and Cable is distributed nationally by General Electric Merchandise Distributors and Graybar Electric Company.

GENERAL ELECTRIC

DELTABESTON WIRE AND CABLE

APPLIANCE AND MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONN.

WIREMOLD 4-A

ONE STRIP THAT HAS EVERYTHING — DOES EVERYTHING



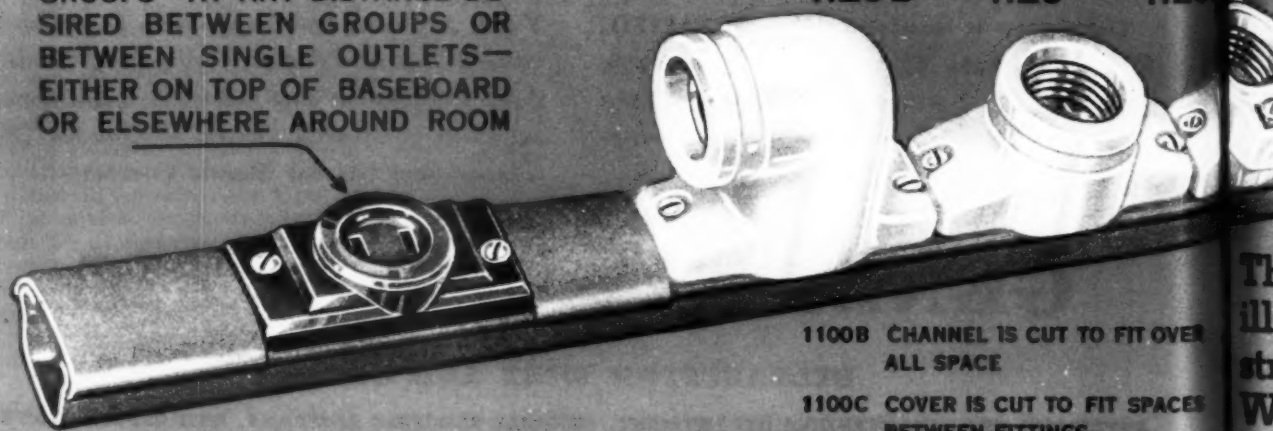
NO. 1127 WIREMOLD OUTLETS MAY BE INSTALLED SINGLY OR IN GROUPS—AT ANY DISTANCE DESIRED BETWEEN GROUPS OR BETWEEN SINGLE OUTLETS—EITHER ON TOP OF BASEBOARD OR ELSEWHERE AROUND ROOM

WIREMOLD LAMP SOCKETS

1126B

1126

1126A

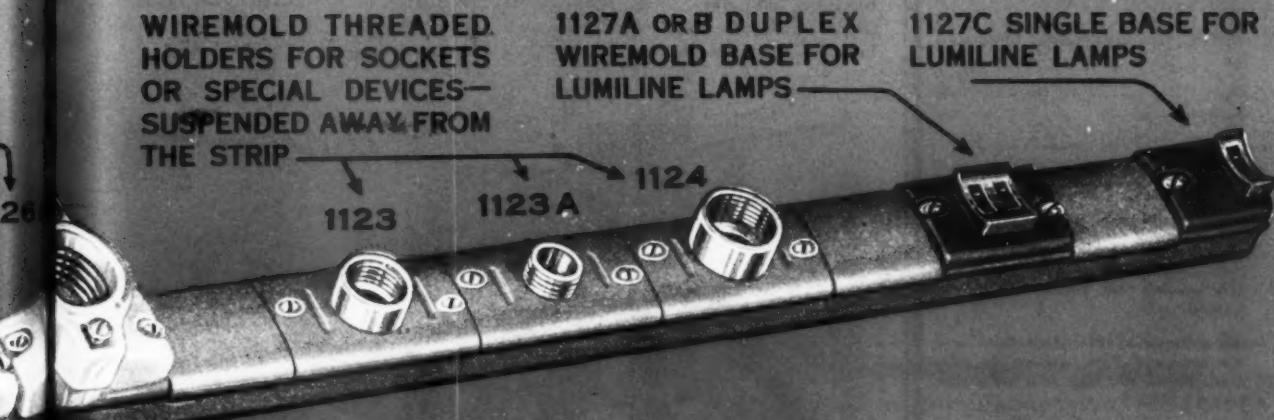
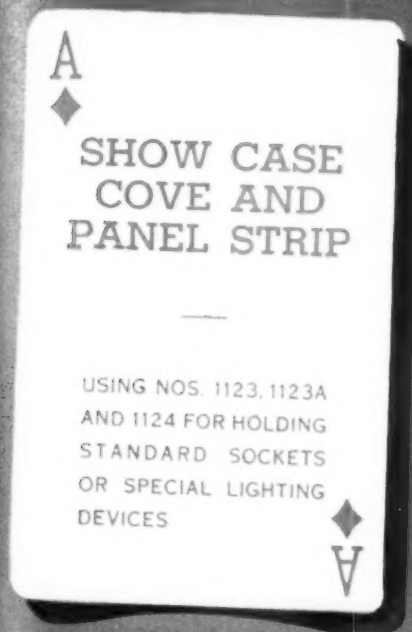


1100B CHANNEL IS CUT TO FIT OVER ALL SPACE

1100C COVER IS CUT TO FIT SPACES BETWEEN FITTINGS

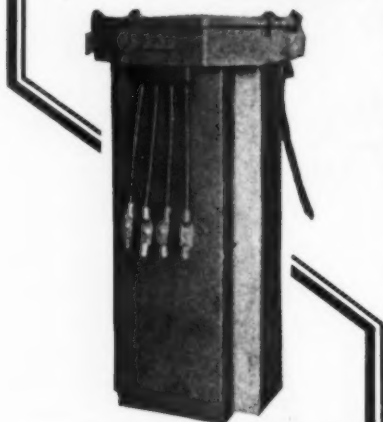
ACE Combination!

DOES EVERYTHING — AND PLEASES EVERYBODY!



This is not an example of actual practice—but it does illustrate and demonstrate the fact that this single strip "does everything"—by use of proper fittings. Write Wiremold Company, Hartford, Conn., for further details

Check these eight features; then specify DISTRIBUTION TRANSFORMERS by AMERTRAN



AmerTran Type RS Distribution Transformers incorporate all latest refinements and are built to meet the most exacting requirements.

1. Coils are vacuum impregnated in varnish.
2. Bushings are of coordinated flash-over type.
3. Transformers are shipped filled with oil.
4. Tanks are fabricated from copper-bearing steel.
5. Covers are cast from nickel-iron alloy.
6. All coils have ample ventilating ducts.
7. Transformers may be completely dismantled and reassembled with a single wrench—no other tool is required.
8. All units are of similar electrical and mechanical design (see cut) in sizes from 1½ to 100 Kva. and for potentials to 8000 V.

May we send data on equipment to meet your needs?



For Better LIGHTING JOBS

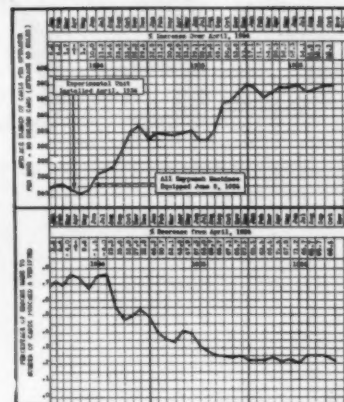
(FROM PAGE 34)

dries where high voltage supplies both the power and lighting loads from the same lines. Here the character of the work is very severe from the lamp standpoint. Second, the high voltage line of lamps is not as rugged mechanically as the standard 100-130 volt lamps.

A large percentage of 200-260-volt installations are direct current and therefore difficult to change over to 100-130-volt circuits. There are very distinct advantages, however, in adopting the lower voltage for the lighting load, and this should be done whenever possible, with these points in mind—

- (a) Lighting load should always be separated from the power load to eliminate the effect of wide voltage fluctuations on light output and lamp performance.
- (b) 100-130-volt lamps, wattage for wattage, cost about 20% less than 200-260-volt lamps.
- (c) 100-130-volt lamps, wattage for wattage, give 20 to 25% more light output.
- (d) 100-130-volt lamps are more rugged because, wattage for wattage, the diameter of the filament is heavier and shorter in length.

So sometimes the use of the next higher wattage lamp is justified, not only for solving the problem of vibration, but also from the standpoint of better lighting. Thus two benefits may be derived.



Curves Don't Lie—Production goes up and errors go down with new lighting.

WHERE LIGHTING PAYS FOR ITSELF

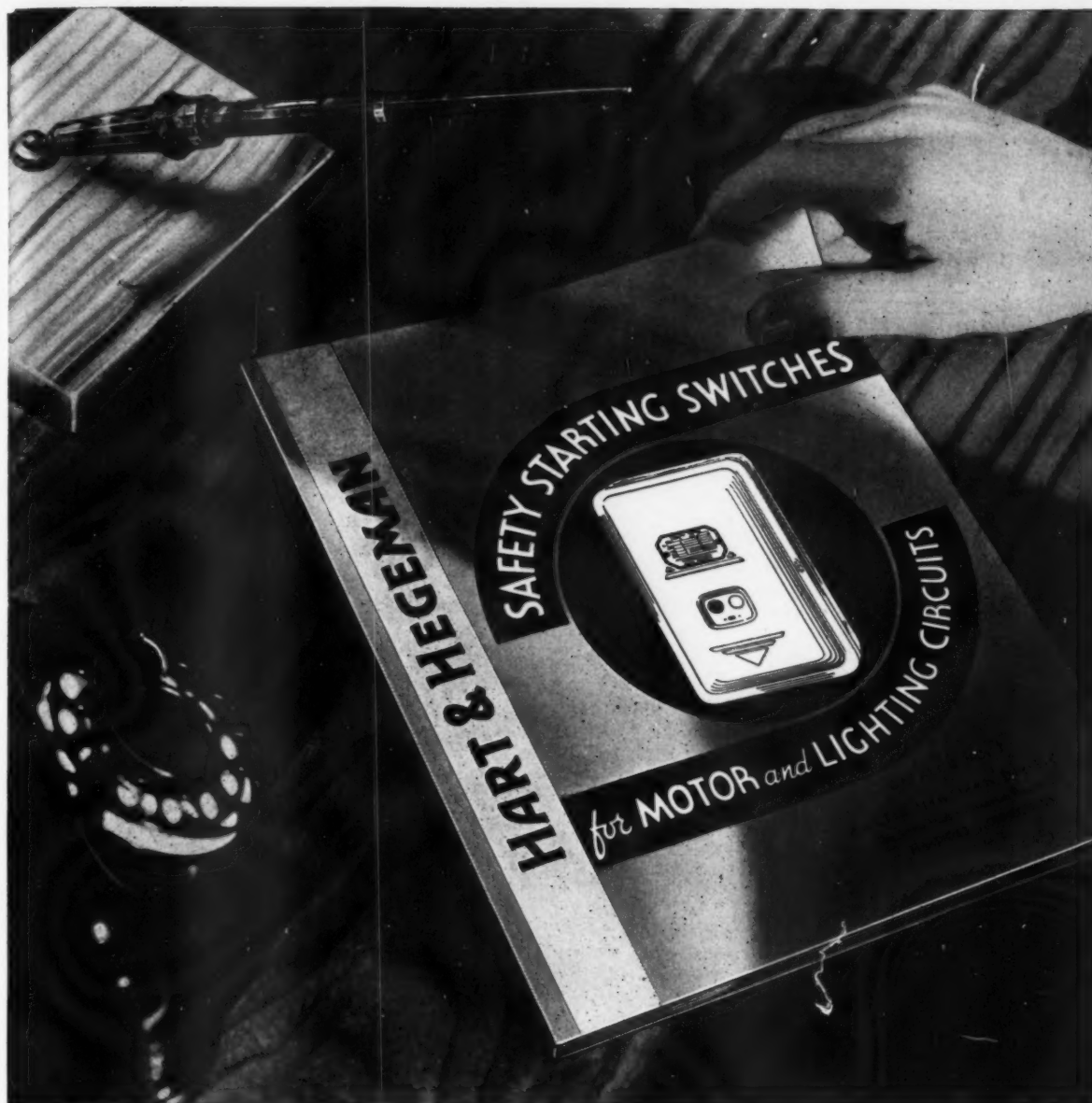
The operation was key punching, substantially 50 per cent of a tabulating job, where the seeing task is critical and prolonged.

Results under a general lighting system of 8 foot-candles, with the operators in a somewhat strained posture, was compared with 60 foot-candles on the work, obtained with a combination of general, plus supplementary lighting with brackets and paper shelves on the key punch machines.

Under the new system operators have been able to approach the index speed of their machines, and production has increased 58 per cent. Also there has been a reduction of 69 per cent in errors. At present, there is only one inaccurate punch in approximately 75,000 holes.



One in 75,000—In this tabulating operation the right balance between general and direct light jumped production 69 per cent.



New Catalog Use this Coupon

of Safety Switches, Service Equipment, Manual and Magnetic Motor Controllers, Master Devices, Circuit Breakers. . . Carefully built, dependable mechanisms, engineered with a background of 46 years' experience in designing and developing electrical controls. . . Modern attractive designs; compact, durable. Simple and easy to wire.

To HART & HEGEMAN DIVISION, Hartford, Conn.

Send your new Safety Starting Switch Catalog No. 7 to

(Name) _____

(Company) _____

(Address) _____

(City & State) _____

4

SOLD THROUGH YOUR

HART & HEGEMAN DIVISION

ELECTRICAL WHOLESALER

THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

Questions ON THE CODE

Answered by F. N. M. SQUIRES

Chief Inspector New York Board of Fire Underwriters

Recessed Lighting Fixtures

Q. There has recently been installed in this city some soffit lighting in the ceiling of a store. These soffit lights are in the form of a metal box, ten inches wide by sixteen inches long by six inches deep, covered with a hinged, glass cover. These boxes are made of 20 gauge metal and are installed in the ceiling in direct contact with wooden supports on all four sides of the box, the glass being flush with the ceiling. The top of the box is about two inches from the wooden floor above it. These soffit fixtures are manufactured by a company that specializes in this type of equipment.

These fixtures are equipped at the present time with two 100 watt lamps, placed parallel to the top of the fixture. The bowl of the lamp is within one-half inch of the metal top.

By placing an ordinary thermometer on the inside of the glass cover and closing the same for a period of fifteen minutes, we get a temperature of 165 degrees at this point. But placing the thermometer over the neck of the lamp and in direct contact with the metal top for the same period of time, results in a showing of 320 degrees. It was impossible to obtain the temperatures on the outside of the box due to the installation.

We are writing you to ask your opinion as to whether or not you would consider this a serious fire hazard.

We are also asking what you would consider the proper method of installation of soffit fixtures of this type, particularly as to the amount of clearance that should be provided for these boxes.—O.L.L.

A. There is a serious fire hazard presented in the use of this type of recessed fixture especially

when lamps as large as indicated above are installed in non-fireproof building construction. Temperatures as high as mentioned above are undoubtedly encountered.

It is a matter of record that accumulations of dust on the upper side of steam pipes have been ignited even though the temperatures have not exceeded 212 deg. F.

It can readily be realized that in

Chases Cheaters

Since taking on the job of city electrical inspector in Youngstown, Ohio, Jack Yahn has been running down cases of unauthorized wiring, when regular inspection duties provide a breathing spell. One of the principal sources of trouble was with installations of small refrigeration equipment and stokers.



Jack Yahn, City Electrical Inspector of Youngstown, Ohio.

When such equipment was sold, the wiring was often done by unqualified persons and added to circuits that were already loaded to capacity. Mr. Yahn took charge on May 1, 1936, and is now working on procedure for the prosecution of cheater violation.

a frame building considerable dust will sift down from the floor above, or even without a flooring above, on to the top of the recessed fixture box and that with an accumulation of a few months or a year there will be quite a blanket of ignitable material ready to start a fire.

This condition has been considered so serious that the New York Board of Fire Underwriters has issued the following bulletin under date of June 16, 1936.

"The following specifications are to be followed in the use of recessed lighting fixtures in building of frame construction.

1. The metal of the fixture box is not to be less than No. 22 ga.

2. For a fixture box large enough to permit the use of a lamp larger than 25 watts, the outside, (top and four sides) of the fixture box is to be covered with either $\frac{1}{4}$ in. asbestos board or 1 in. of rock wool.

3. Rubber covered wire is not to be taken to nor into, the fixture box. This also means that an outlet or junction box located on the fixture box shall not contain any rubber covered wire. Any rubber covered wire is to terminate in a box at least 4 in. away from a fixture box.

4. Solder should not be used in the fixture box construction. Screws, bolts, rivets, or welding may be employed for this."

At the present time Underwriters' Laboratories is conducting an investigation of this matter and will shortly be in a position to test this type of fixture and to approve those that are safe to use. As soon as this service has been established inspection departments will do well to require the use of only approved fixtures for safety's sake.

Replies to "A Problem for Discussion"

An item in the December issue, describing an armored cable fire, has stirred up quite a bit of interest among our readers, some of whom have had experiences somewhat similar to the one reported. Among the replies the following were of such interest that we are quoting them below,—

1. "Replying and referring to 'A Problem for discussion' will say that I have been installing armored cable for the past thirty years and I have never had such a thing happen to me until a few days ago when a range feeder, 3-wire No. 6, protected by 50-amp. fuses, was completely burnt up before the fuses



WATCH FOR THE MAN WHO CARRIES THIS PORTFOLIO!

He will show you the finest, most complete and fastest-selling line of electric fans in the industry! • He will show you the greatest line-up of fan sales helps that you have ever seen! • He will show you how General Electric Fans will write fan profits in **your** ledger!

**WATCH FOR HIM! LISTEN TO HIM!
YOU'LL PROFIT BY HIS SOUND ADVICE!**

GENERAL  ELECTRIC
FANS

APPLIANCE AND MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

Electrical Contracting, February 1937



● And the conversation continued . . . "Just what do you mean?" "Well, I had a problem like yours a few months ago and I took it to the Consolidated Engineering and Design Service. Together we worked out the shape, and into production it went immediately. By the time the building was ready, the first shipment of globes was on hand."

● Stories like this are not uncommon. Special shapes are needed. And needed at once. Many men, responsible for the selection and installation of illuminating glassware, have learned that the complete service at Consolidated has saved them time and money.

● The Consolidated Engineering and Design Service, supervised by a competent designing engineer, is backed up by adequate production facilities.

● Bring your illuminating glassware problems to Consolidated for a frank discussion. There will be no obligation on your part. May we talk with you?

The complete line of standard illuminating glassware manufactured by Consolidated also merits your attention. The new, colorfully illustrated catalog should be in your files for ready reference. Send for your copy.

CONSOLIDATED
Quality
GLASSWARE

**CONSOLIDATED
LAMP AND GLASS COMPANY
CORANPOLIS, PENNSYLVANIA**

Questions ON THE CODE

[FROM PAGE 40]

blew. Now I have never liked armored cable, as I never thought it was right, and more so now, (with what has happened) with its grounded neutral and metal armor and the paraffin paper even taken off of it. If I install any more it will be at the owner's risk and I am trembling in my shoes for what the old installations are going to do.

If you can find out the cause I would appreciate that information so that I might protect my old jobs.

—M.J.B.

2. "I read with interest the article on your page entitled 'A Problem for Discussion' and I believe the polarity of the branch circuit wires was reversed and, therefore, the fuse was in the grounded line instead of in the hot line.

I once had occasion to shoot a case of similar trouble on a 2-wire sgl. fuse service. In my case the hot side of the line was unprotected back to the Electric Company's transformer and caused some of the cable in the premises to get red hot.—D.S."

3. "In reply to 'A Problem for Discussion' in your December department, did your correspondent short his circuit wires or ground the hot wire to the armor of the cable? If the former, the fuses should blow unless his run is excessively long. If the latter, the explanation is not very difficult.

In a run of some distance the armor of the cable has enough resistance that a fuse will not readily blow. The armor acts the same as the element in any heater. The poor connection of the circuit wire with the armor, together with the resistance of the armor, will often heat the metal of the armor hot enough to fuse the armor and vaporize the copper.—G.E."

4. "I am interested in the article 'A Problem for Discussion', which appears in the code section in your December issue.

This past summer we had a similar experience. Lightning struck a house, made a small hole in the roof, jumped to a line of BX cable in the attic and thence to ground. At the same time it fused the hot wire into an outlet plate in a fixture in a first floor room.

The next afternoon the occupants of the house smelled smoke and upon investigation found a closet all afire, this closet being located di-

rectly over the grounded fixture. At the time the lightning struck the circuit fuses were blown and were replaced with 15 amp. fuses. This fire clearly caught from a line of BX that runs up thru the closet.

There is too much resistance in the metal armour to blow the fuse before the armour gets too hot for safety. The grounded outlet was at the extreme end of at least 100 feet of cable.

I have always thought that BX cable would be much safer if a bare stranded No. 14 wire was wound along with the two insulated wires inside the armour and this wire bonded to all outlet boxes, plates, and boxes.—C.E.P."

Flexible Conduit Near Sprinklers

Q. Does the Code prohibit the installation of flexible steel conduit in a place equipped with sprinkler heads?—B.C.D.

A. This question probably originates from the thought that water is always present in the sprinkler pipes.

But while there generally is (except on the dry systems) water in the pipes there is no water outside of the pipes or heads and moisture is not normally present from the sprinkler equipment in a room so protected. The only time water is normally present is in case of a fire.

Therefore, there is no restriction on the use of flexible conduit just because sprinkler heads are present.



Traffic Abuse: Service conduits that run along alley walls must be able to "take it" from heavy trucks in the hands of careless operators. Here is a 2-in. conduit in a Buffalo alley that got a jolt which dislodged it from a semi-flush chase or groove. Still in service, the pinched No. 8 conductors will soon cause grief to an unfortunate owner.

Application Installation *and* MAINTENANCE

In Industrial, Commercial and Institutional Buildings

To Prevent Interruptions

How six plants in different industries are doing it

"Keep the wheels turning!" That's going to be Front-Office orders to every maintenance man for some time to come. Production schedules are up everywhere, and interruptions just won't be tolerated.

What are plants doing to combat shutdowns? The Maintenance Editor decided to find out. Here are six timely examples from plants in a variety of industries. Space won't permit a detailed description of each

problem and its solution—but these "case studies" should give the ingenious maintenance man an idea or two.

Equipment Changes Without Delays

1. Power supply in industrial laboratories must be flexible so that experiments can be carried on without stops. To take care of vari-

ous power requirements the Shell Development Co., Emeryville, Calif., tried a flexible distribution system which has been very satisfactory. It consists of an overhead bus suspended from the ceiling and inclosed in a metal housing. Where circuits are required in the room, the bus is tapped and conduit run down the wall to fuseless circuit breakers and then to the outlet.

The main features of the system are: (1) Large electrical capacity for a small space; (2) power available where required; (3) ability to obtain 220-110-volt service at any point; (4) minimum investment and disturbance to the room.

Electric Heat Eliminates Shutdowns

2. The West Co., Philadelphia, Pa., manufacturer of molded rubber products, had been using steam heated platens to cure rubber. However, after a length of service the flexible connections would leak, condensate would drip to the floor, and escaping steam would increase the humidity of the press room to such an extent that five or six days of shutdown occurred during the course of each summer.

When the company found that increasing production would require more presses, it decided to try electrically heated platens. After the first changeover was made other machines were also equipped for electric heat as soon as they were available.

In the circuit of each platen a green light indicates that power is off or a red light shows that the platen is energized. Thermostatic control holds the temperature within 2 deg. F. of the desired figure.

This use of electric power has eliminated seasonal shutdowns, reduced maintenance costs, improved working conditions, and resulted in better control of curing because of the closer heat regulation.



SIT DOWN!—It's a strike!—but also a perfect picture of what happens when machines are idle. And there is a moral for every maintenance man.

WIDE WORLD

NO INTERRUPTIONS if electrical maintenance is up-to-the-minute		
Guard against these interruptions	. . . with these modern practices:	Type of equipment involved
1 — Avoidable accidents	Safe electrical distribution and power transmission; safety appliances on equipment; high levels of illumination throughout plant	Dead-front panelboards; breaker protection for individual circuits; gear-motors or short-center drives where belting would be dangerous; explosion-proof motors and lighting units for hazardous locations; limit switches or photo-tube safety controls on machines and conveyors; simple, pushbutton control on motors.
2 — Machine outages caused by power shut-offs on temporary overloads	Instantaneous re-establishment of power after shut-down	Easily reset, low-rating, non-arcing circuit breakers instead of fuses to protect individual machines and circuits.
3 — Delays in re-arranging production equipment	Flexible electrical distribution systems, together with easily re-arranged production layout	Bus bar electrical feeders, to which flexible leads from machines can be readily clamped at conveniently spaced plug-in points; driving motors and lighting units integrally mounted on machines.
4 — Motor burn-outs	Exact motor application and protection	Motors with torque and speed characteristics recommended for the job; over-load and no-voltage protection; starters and controllers where motors are not across-the-line units.
5 — Piling up of work from conveyors	Automatic stopping and starting of conveyors	Limit switches tripped if load piles up; photoelectric devices shutting off power when light beam is interrupted by work stacking up on conveyor end.

Electric Eye Prevents Paper Breaks

3. At the Piedmont plant of the West Virginia Pulp & Paper Co. interruptions caused by paper breaks have been eliminated by maintaining a definite tension on the loop of paper between the coating rolls and the drier section. Because of the wet condition of the sheet, a mechanical means of control is impracticable. Phototube — "electric eye" — control keeps the individual

motor drives operating at the right speeds. If the loop becomes too long the drier motor is speeded up, and if too short, the motor speed is reduced.

Soldering in Less Time

4. Electric soldering by means of a special transformer circuit is used at the Trenton Auto Radiator Works, Trenton, N. J., to fasten fins

to small refrigerating coils. The transformer operates on 220 volts, with high amperage and low voltage on the secondary. Current passes directly through the tinned tubes (which are made part of the secondary circuit) and heats them in 10 to 15 seconds, melting the solder. When the solder cools a metallic bond is formed with the fins.

This soldering operation is completed in about one minute, as compared with fifteen minutes under the old method, which consisted of immersing the coils and fins in a solder bath. Moreover, the coils are cleaner and have a better appearance, economy is effected in the use of solder, and the fins retain their texture and temper because they are heated at the contact points only.

No Stopping for Imperfections

5. In the inspection department of a Cincinnati lithographing plant girls are stationed along a conveyor on which white cardboard sheets travel at a rate of 85 per minute. They reject faulty sheets to avoid expensive printing processes being completed upon them.

The girls complained of fatigue, and their rate of mistakes was high. Here's how both problems were solved:

- (1) Poor contrast and an annoying "shutter effect" were eliminated by having the moving sheets separated approximately 8 in., and a narrow white screen placed across the conveyor in front of each girl. The sheets now pass over the strip without contrast.
- (2) Illumination was increased from 25 foot candles to the unusual value of 500 footcandles. The higher intensity had the effect of materially reducing the "apparent speed" of the belt, a phenomenon well known to illumination engineers.
- (3) A light tan screen was suspended from the ceiling and along the conveyor. This cut off the rest of the floor from the girls' line of vision, thereby eliminating distractions and increasing accuracy.

Traffic Congestion Now Under Control

6. City Mills, Columbia, Ga., has solved an internal "traffic congestion" problem with a combination passenger and freight elevator. It is essentially a vertical rubber conveyor belt, with steps and grips at

convenient intervals. Traveling continuously at 90 ft. per min., this elevator provides immediate transportation up and down, to and from all floors. Several employees can ascend on one side while others descend on the opposite side, alighting where they please without interference. When the elevator is used for packages or bags, tripping devices provide automatic discharge.

Officials of City Mills state that it was able to unload two cars of 100-lb. bags, 500 in one and 200 in another, in one hour and twenty minutes, whereas it formerly took the men on this job eight hours.

Safety First

Lighting fixtures for general illumination are suspended at a height to provide for a predetermined amount of light intensity on the working plane. For scheduled cleaning and replacing of blackened or burned-out lamps a ladder or a make-shift in one form or another is generally used. This is a hazardous method not only to the workman himself but to the men beneath him.

The illustration below shows a device, consisting of pole, prong and basket, for replacing lamps.



NO BREAKAGE
and no risk to eyes from shattering glass falling from overhead.

Economize With Centralized Control

In a Chicago mill the new control system (installed after a fire had completely destroyed the old) provides for remote control of all the motors ranging from one to 150 hp. The starting and control equipment is centralized in a single room. Wiring arrangements permit the machines to be controlled either in groups from a master control or individually.

Several push button control stations are at central locations on each floor. Equipment such as grinders, mixers, elevators and conveyors can be started and stopped from any station on any floor. Pilot lights which are mounted directly above the push buttons indicate operation of equipment not within view from the station.

The following results have been obtained:

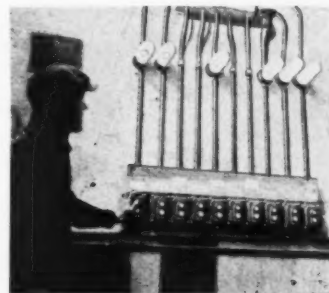
1. Insurance rates have been lowered.

2. Time is saved because the men have less traveling distance to start or stop equipment.

3. Production on large groups is not delayed by occasional breakdowns.

4. Spoilage from choke-ups is eliminated because machines can be stopped immediately.

5. Power is saved by shutting down individual machines when not in use.



WITH BUTTONS—A convenient centralized remote control and signals.

To Maintain Plant Telephones

By Albert A. Schuhler

Signal Specialist

Communicating systems are installed to render service to an organization and the necessity for keeping them in proper operating condition is obvious. The following points may help to locate sources of trouble on intercommunicating telephone systems. A similar outline for bell systems, audible paging systems and fire alarm systems (closed circuit type) was presented in the December, 1936, issue, p. 35.

Ring trouble general throughout system.

1—Check for weak ringing battery, defective transformer, defective battery eliminator, or "blown" fuses.

2—Test for open, short-circuited or grounded common ringing battery wires.

3—Adjust bells.

Ring trouble limited to part of system.

1—a—Examine bells for dirty or

pitted contacts, caused by accumulation of dust, lint, oxidation or sparking due to excessive voltage.

b—Sticking armature resting against magnet cores caused by weak adjusting spring.

c—Defective adjustment between contact screw and contact spring.

d—Loose terminal connections.

e—Open electromagnet circuits.

2—Examine pushbuttons on telephones for defective contact between springs and loose connections at terminals.

3—Examine normally closed circuit contact springs on receiver hook which are connected to bell.

Talking or hearing trouble throughout system.

1—Check for weak talking battery, battery eliminator, or "blown" fuses.

2—Test for open, short-circuited or grounded common-talking or battery wires.

3—Examine retardation coil at battery, battery eliminator, or in the telephones for open or short-circuits.

Talking trouble limited to part of system.

1—Examine "talking" contact springs in receiver hook, or locking-button contacts on "talking" plate leading to transmitter.

2—Test transmitter for open or short-circuit.

"Hearing" trouble limited to part of system.

1—Test receiver and receiver cord for open or short-circuit.

2—Examine receiver diaphragm for dents, irregularity in shape, or iron dust accumulation around magnet poles of receiver.

3—Examine "talking" contact springs in receiver hook, and push-button contacts which may be a part of the talking circuit.

Noisy talking circuit general throughout system.

1—Test for grounded circuit.

2—Examine for too high voltage to transmitter from talking battery or eliminator.

3—Examine for loose connections

on talking battery, eliminator, or on talking battery wire.

4—Check battery for weak or "dead" cell.

Noisy talking circuit limited to part of system.

1—Examine receiver cords for broken wires.

2—Examine for loose connections in telephones and wiring.

3—Examine "talking" contact springs in receiver hook, "talking" circuit buttons, jacks, or key contacts for defective connection.

More than required number of stations called at same time.

1—Examine multiple pushbuttons, as contact springs which should be normally open circuit may be on closed circuit, due to sticking of pushbuttons, or contact springs may be broken. Contact springs are sometimes crossed by pieces of bare wire, solder, or other metallic object.

2—Test for grounded, short-circuited or crossed section wires.

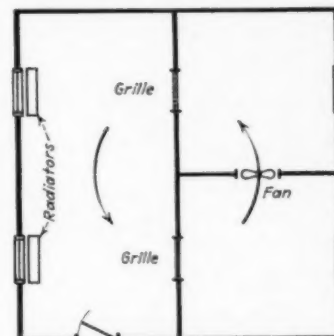
3—Examine wires at telephone instrument terminals for crossed wires.

4—Examine section wires at damp locations for short-circuit or grounds due to defective insulation.

To Ventilate a Partitioned Office

Occasionally large offices are subdivided into two or more rooms. In a case brought to our attention, where partitions were extended to the ceiling, heating and ventilation became a problem because the radiators were along the one wall and beneath the windows.

The solution, as shown in the illustration, was to insert two grilles



OFFICE AIR—Fan and two grilles for circulation of air.

in the partition separating the two smaller offices from the main room, and to put a circulating fan in the partition separating the two small offices. Since then, an even temperature has been maintained in winter and summer ventilation is good.

Better Quality In Plating Room

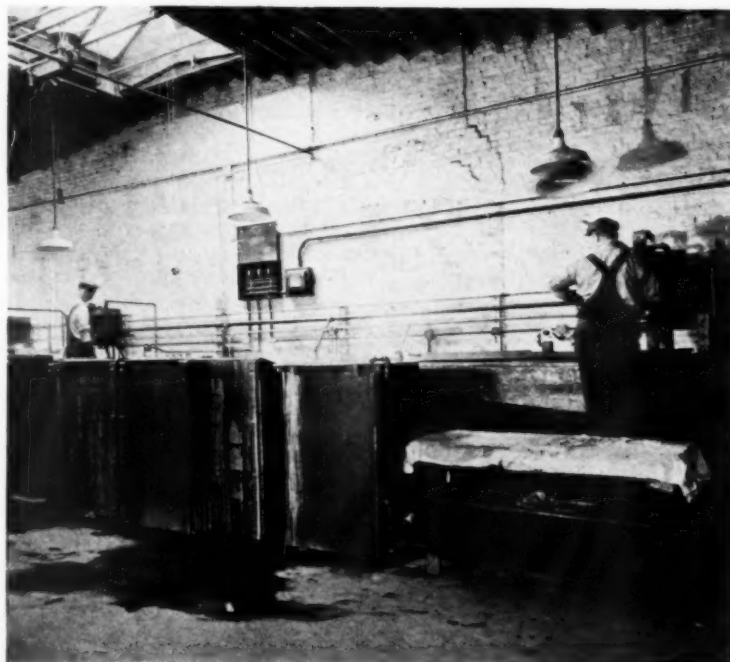
You can't be careless about bath temperatures in chromium plating if you want to get a good article.

If temperatures are too low, the work is spotted and has an uneven cover; if too hot, the covering is a dull gray or has a burnt effect, almost impossible to buff.

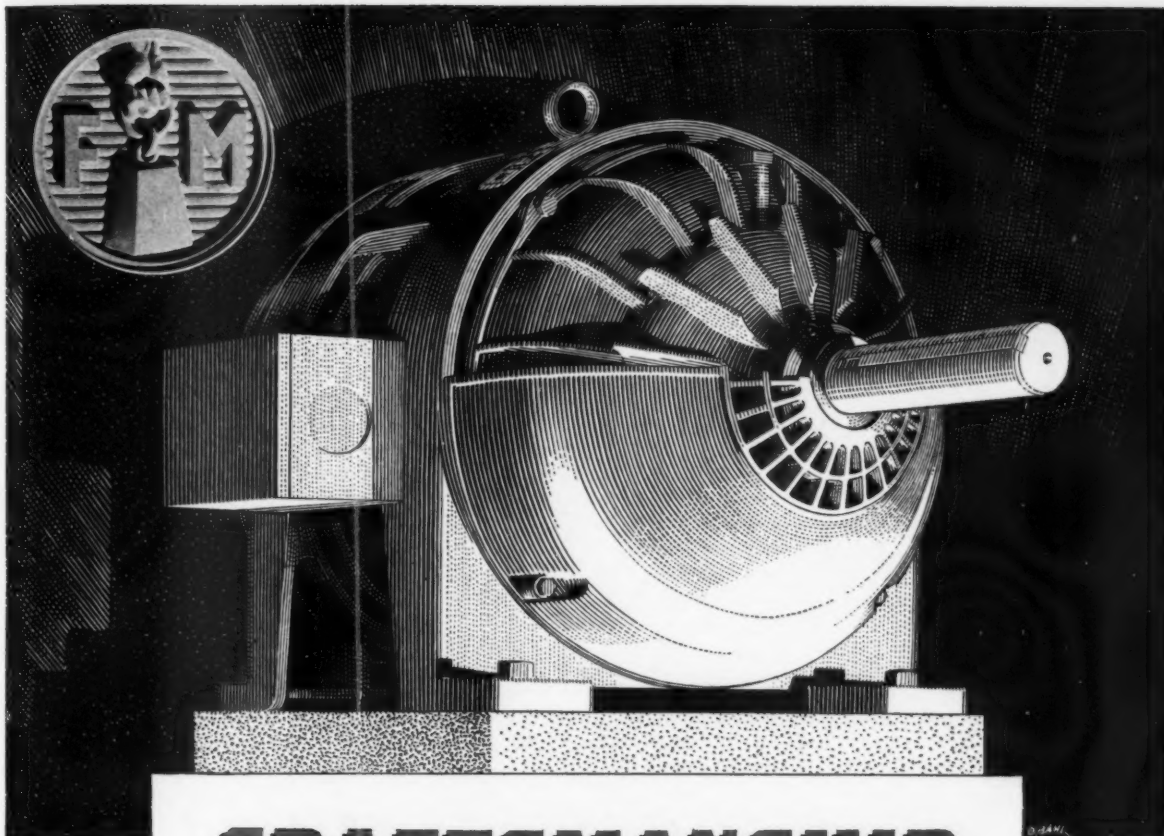
The Kalamazoo Plating Works, Kalamazoo, Mich., has made its chromium plating absolutely independent of weather conditions. Cold snaps no longer affect quality. The company's major work is plating grilles for such cars as Hudson, Oldsmobile, Reo, and others.

Electric immersion heaters are used in conjunction with close thermostatic control. The units have increased the speed of production, greatly improved the product, and effected a saving of twenty per cent in supplying the heat.

The old arrangement, using steam, controlled by solenoid valves, had the disadvantage of a time lag in regulating the bath temperatures.



BETTER PLATING—Four immersion heating units with close thermostatic control, replaced steam heating in this chromium plating operation.



CRAFTSMANSHIP IS SELF-REVEALING!

• Ordinary motors won't do, out in the shop where metallic dust and particles fill the air. They won't do where corrosive gases or fumes would soon ruin a standard-type motor.

So we build a special motor for this service. Totally enclosed. Fan-cooled. Ball bearing. With fans on both ends of the motor shaft to eliminate "hot spots." And all of this without excess size (mount-

ings are the same size as standard open types). In every line, every construction feature is motor craftsmanship at its best—craftsmanship that is self-evident when you see this great motor in operation.

If your service requires motors that can "take it," write for Bulletin E421, Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Ill. 34 branches at your service throughout the United States.

88KEA40.117

FAIRBANKS

POWER PUMPING
AND WEIGHING
EQUIPMENT



MORSE Motors

ELECTRUNITE Steeltubes

REG. U. S. PAT. OFF.

NO OTHER ELECTRICAL METALLIC TUBING

SEVEN SIZES 3/8" TO 2"



FOR OPEN AND CONCEALED WIRING
SEE CURRENT EDITION NATIONAL ELECTRICAL CODE

CAN GIVE YOU ALL THESE



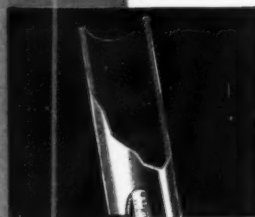
PERFECT WELD



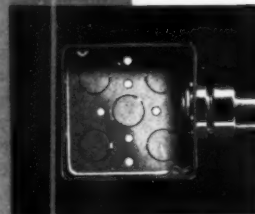
GREATER DUCTILITY



KNURLED INSIDE FINISH
PATENT 1,962,870



FORM CORROSION RESISTANCE



SEVEN YEARS' EXPERIENCE



STOCKS EVERYWHERE



Steel and Tubes, Inc.

THE LARGEST PRODUCER OF ELECTRICALLY WELDED TUBES
CLEVELAND OHIO

ELECTRUNITE STEELTUBES is the original Electrical Metallic Tubing, developed and pioneered by Steel and Tubes, Inc., Electric resistance welded by the same process used in manufacturing ELECTRUNIT Boiler Tubes and Mechanical Tubing, the weld is tough, uniform, and produces tubing that is practically seamless.

Because of the unique welding process and the fact that ELECTRUNIT STEELTUBES is made from high quality open hearth steel, cold-rolled and cold formed, it bends easily and perfectly. It may be straightened and rebent just as easily. A simple roll-type tool makes accurate bends—up to 90° in one sweep.

The inside surface of ELECTRUNIT STEELTUBES is not smooth as in ordinary raceways, but is knurled—composed of thousands of tiny rounded knobs rolled into the steel. This modern development by Steel and Tubes, Inc., reduces drag of cables, makes wire pulling approximately 30% easier and reduces tendency to jam when pushing short runs.

The cold worked surface of ELECTRUNIT STEELTUBES is in itself resistant to corrosion. To increase this resistance and to make it positive at every point, a tight coating of zinc is applied by an exclusive electrical method that insures absolute uniformity of coating which satisfactorily penetrates the surface of the steel to prevent flaking of the galvanized coating when the tubing is bent.

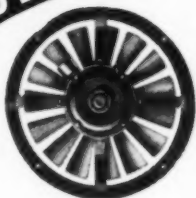
And don't forget the experience gained in 7 years of making over 125,000,000 feet of ELECTRUNIT STEELTUBES, now installed in every type of installation. This background of experience in pioneering and developing ELECTRUNIT STEELTUBES is your assurance that in buying this original Electrical Metallic Tubing, you have the best product that modern methods can produce.

ELECTRUNITE STEELTUBES is stocked by all of the leading electrical wholesalers throughout the country who are ready to give you prompt service. This widespread distribution set-up is at your service and further proves the popularity and demand for genuine ELECTRUNIT STEELTUBES.

OTHER ADVANTAGES

ELECTRUNITE STEELTUBES is light in weight, easy to handle and install, and requires only three simple compression type fittings to make positive, safe, watertight joints. It affords adequate electrical and mechanical protection for wiring—is fully approved for almost every type of construction. With all necessary fittings it actually costs less than threaded conduit, and with all its advantages, genuine ELECTRUNIT STEELTUBES costs no more than imitation brands. Ask your wholesaler, or write us for information.

Profit with Peerless EXHAUST FANS

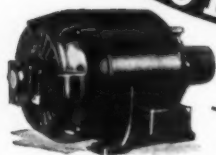


CONTRACTORS who sell large air movements at lower power consumption select Peerless Exhaust Fans, because the Peerless design provides quiet operation with large air capacities at low cost.

These fans have a wide application for offices, stores, factories, theaters, restaurants and similar buildings, since they are provided with multi-speed controllers to meet all requirements.

Write for
complete
specifications

Peerless MOTORS



are used by contractors who want a motor that is a little different—a little more precisely made—a little better than the average motor.

Whenever you recommend Peerless you can assure your customer that the motor is guaranteed to give satisfactory service and long, trouble-free operation. Send for the Peerless Motor Catalog.

A few territories for distributors are open. Write for details.

THE PEERLESS ELECTRIC CO.
WARREN, OHIO

WHAT VOLTAGE VARIATION DOES to General Purpose Induction Motors

Voltage Variation	How Effected					
	Horse-power	Torque (starting and pull-out)	Slip	Heating	Power Factor	Efficiency
Increased 10 Per Cent	5 H.P. motor has characteristics equivalent to 6 H.P. motor	Increased in proportion to square of voltage	Decreased approx. 17 per cent	At rated horsepower load — will not exceed safe limits when operating in ambient temperatures of 40 deg. C. or less although usual guaranteed rise may be exceeded	Decidedly lower	Slightly increased
Decreased 10 Per Cent	5 H.P. motor has characteristics equivalent to 4 H.P. motor	Decreased in proportion to square of voltage	Increased approx. 21 per cent		Decidedly increased	Slightly decreased

Note — Numerical values are given as an example to show the effect on some operating characteristics when a 5 h. p. motor is operated at full rated horsepower load.

Don't Strain the Eyes!

Eye strain can be minimized in doing fine work by operating a 32 candlepower spotlight from a 12-16 volt transformer, connected to a 115 volt a.c. circuit. The light concentrates its 200 foot-candle beam over the small area.

Automatic Stop Prevents Spoilage

Small electric switches were installed to stop automatically "inner-construction" machines used in the manufacture of "Beautyrest" mattresses at the plant of the Simmons Mattress Company, Linden, N. J.

"Inner construction" machines, of which a sewing machine is a component part, are used to form, compress, and feed mattress springs to separate pockets in one continuous strip of cloth, which passes to the sewing machine where the springs are sewed into pockets. Then the pressure on the springs is released and the springs, are turned automatically 90 degrees and fill the pockets by further expansion.

Considerable material was spoiled when the machines did not stop quickly at the frequent and unavoidable thread breakages.

The thread now passes through a small lever which is mounted on the frame of the sewing machine. Thread tension holds this lever in an up-

right position but when the thread breaks the lever drops and engages a projection on the switch, completing an electric circuit. The switch energize a solenoid which, in turn, operates a clutch, disengaging a driver pin to a pulley and stopping the complete machine instantly. Belt drive is used to take advantage of belt slip in case the cloth jams.

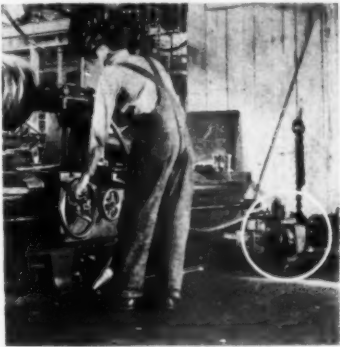
A condenser is connected across the solenoid terminals to reduce sparking at the switch thereby minimizing a fire hazard because of the presence of lint and dust.



RELEASES TENSION—When thread breaks switch stops machine.

Repair Shop Grinder On Wheels

A portable grinder can be used to an advantage when repairing parts, particularly large ones, on which the grinding operation must be done on the job or when a part is turned in a lathe. For the latter, a flexible



PORTABLE GRINDERS—For Repairs at the Job.

set-up has been used in a New England plant and is shown in the illustration.

The grinding wheel is driven by a flexible shaft from a 2-hp. motor which, mounted on a platform with wheels, may be conveniently moved from one place to another. A long rubber-covered flexible cord permits plugging-in at any convenient outlet. Three speeds can be obtained by the pulley arrangement on the motor. A small V-belt transmits power from one of the pulleys on the motor shaft to one of three pulleys on a goose-neck extension mounted on the motor frame, which drives the flexible shaft and grinder.

Scheduling Reduces Demand Charges

Total connected load in the aluminum foundry of Eclipse Aviation Corporation, East Orange, N. J., is 280 hp. A heat-treating furnace consumes 172 hp. Depending on the quantity of castings, it is heated to required temperature in 2 to 2½ hours. After that, power is used intermittently.

A time switch was installed to start the furnace after 5 p.m. and to shut off power at 7 a.m. This night operation, at a time when practically no other power is required, reduced demand charges considerably.

During the day the metal is melted and poured and the castings are cleaned and ground.



YOUR MACHINERY IS AT A *Standstill*

Industry demands of a motor brush much, such as overloads, sudden peaks or mechanical shocks. If the brush fails in such emergencies your machinery is at a standstill. Such an experience costs money, time and of course a great loss in production.

Ohio Carbon Brushes, scientifically made, are well able to meet any of these emergencies. That's why thousands of industrial plants have for years chosen Ohio Brushes as insurance against costly shut-downs and delays.

*Try Ohio Brushes and eliminate
these expensive shut-downs.*

THE OHIO CARBON CO.
12508 BEREA ROAD
CLEVELAND • OHIO

ELECTRICAL

● Did you know that Bunting Electric Motor Bearings for service replacement in motors of all makes from ¼ hp. to 60 hp. are instantly available from stock? Write for catalog giving complete data and prices.

BEARINGS

● These Bunting Stock Bearings are ready for immediate assembly with all oil grooves, holes and correct machine work. They are procurable instantly in any quantity—small lots at big-run prices. The Bunting Brass & Bronze Company, Toledo, Ohio. Branches and Warehouses in All Principal Cities.

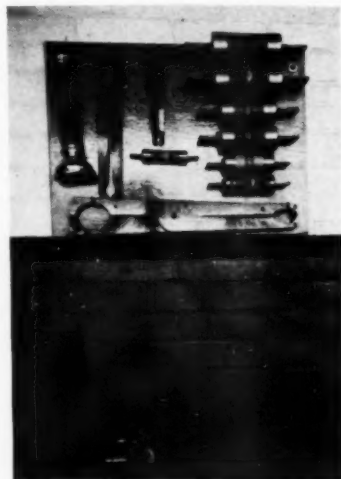
IN STOCK..

BUNTING *Quality*
BRONZE BUSHINGS • BEARINGS
MACHINED AND CENTERED BRONZE BARS
ANTI-FRICTION BABBITT



Ready for a Major Breakdown

When trouble strikes at the heart of an industrial plant feeder distribution switchboard, the maintenance department should be prepared to restore service quickly. To meet such an emergency, in the Hygrade Sylvania Corporation's radio tube



FOR SAFETY—Spare fuses, pullers, flash lamp and a fire extinguisher.

factory at Salem, Mass., an assortment of spare fuses, three fuse pullers and a flash lamp were provided outside the room in which the switchboard and large pump motors are located. Directly below the ply-wood panel that has this equipment arranged on it, there is also a CO₂ extinguisher, just in case an insulation blaze must be checked.

Spare fuses are rated 500, 450, 400, 225, 200, 150 and 100 amp., while the three insulated fuse pullers are for 400/600 and 201/400, 201/400 and 101/200, 30 and 60-amp. sizes. With this combination of equipment available for emergencies, there need be no delay or confusion if quick action is needed.

Did He Save On Lights?

A large underwear manufacturer was told how 200 watt lamps could be replaced by "75" and "100" watt lamps and he would have the same amount of light. The lamps were received and installed but the light was slightly less than had been expected from the lamp ratings. Some doubt was raised as to the correctness of the wattage marked on the lamps. A test was made—"75" watt lamps required 135 watts, and "100"

Listed by Underwriters' Laboratories



10 Amp. "T" 125 Volts
5 Amp. 250 Volts

Install MCGILL Levolver switches for safety, economy and convenience. For individual control of fixtures or in combination with wall switches. The No. 1010 will handle any size Mazda lamp or combination of Mazda and high intensity lamps up to 1000 watts. Also for fractional h.p. motors. Your wholesaler carries them in stock.

McGill Lamp Guards

for Every Purpose



No. 7000-SE Portable Lamp Guard with Rubber Handle

No. 1425 Loxon Guard

A—Fibre shields to control the arc. B—Heavy inner contact spring to give good electrical contact. C—Double outer contact springs to provide greater resiliency, giving longer life.

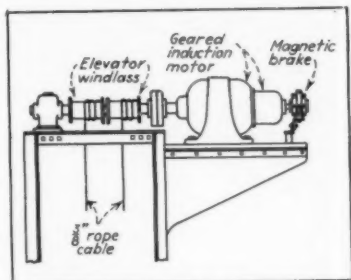
Write for Bulletin No. 59
MCGILL MANUFACTURING CO.
VALPARAISO, IND.

Box No. 670

watt lamps, 183 watts. As a consequence, the cost of power for lighting was twice that indicated by the lamp rating, and—their life—?

Gearmotor Drive Saves Space

A saving of about one-third the space required by an induction motor with separate gear reduction was made by the Boston Envelope Company, Dedham, Mass., when a 1½-hp. geared induction motor was mounted on an extension bracket at the top of an elevator frame. One coupling and two bearings were eliminated. Overall length is 24½ in. for motor



ELEVATOR DRIVE—Geared induction motor and magnetic brake, on extension bracket.

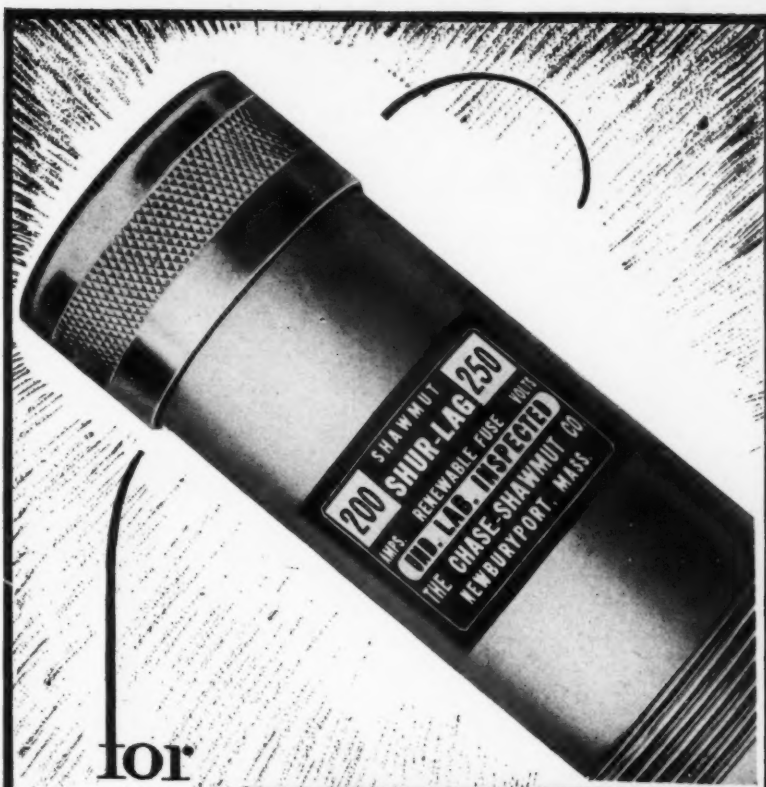
with integral gears and attached magnetic brake.

Motor operates at 1,800 r.p.m., and elevator windlass at 14.4 r.p.m. The elevator has a capacity of 3,000 lb., and a speed of 13½ ft. per min. Two winding drums on the main shaft and a ¾-in. rope cable raise and lower the 7 x 8-ft. platform a distance of 5 ft. The elevator is used in handling material between the shipping room and floors of road trucks at the plant doorway.

Use of Waste Heat

Waste heat formerly exhausted from a tunnel kiln is now utilized for heating the entire plant of a New Jersey porcelain company. It is distributed by three motor-driven blowers and a duct system to two floors, with a total area of 102,000 square feet.

Outside air is passed through a muffle in the kiln just before it enters the blower intake. A special small fan is used to mix fresh air with the heated air for the office-supply duct. The oil-burning kiln operates continuously and no heating trouble has been experienced even on the coldest days.



for
**SUPERIOR
FUSE
PERFORMANCE**

SHAWMUT SHUR-LAG RENEWABLE FUSES



Experience that comes through 44 years of "knowing how" is behind every Shawmut Shur-Lag

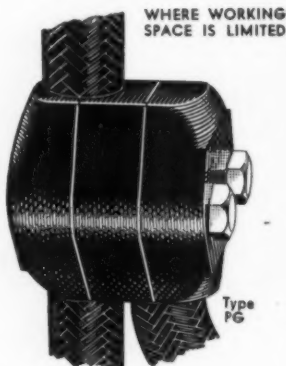
Renewable Fuse. Construction is simple and sturdy—operation is unfailing. Shur-Lag gives greater time lag under unusual overloads, which means savings in time and money.

Write for Shur-Lag literature with illustrations and prices.

THE CHASE-SHAWMUT CO.
NEWBURYPORT, MASS.

FUSE SPECIALISTS SINCE 1893

Insulated BURNDY TAPITS



CABLE taps in cramped quarters no longer mean difficult taping and dangerous soldering. The Insulated Burndy Tapit eliminates these costly steps . . . makes a quick, neat, dependable cable tap with a few turns of a wrench.

BURNDY
ENGINEERING COMPANY, Inc.
459 E. 133rd ST., NEW YORK, N.Y.

481 REWIRING JOBS

Sold by Clark and Mills, Boston,
with the assistance of a

MODEL DM MEGOHMMETER

Live wires, these Boston contractors Clark and Mills brought in \$95,287 worth of business by free inspections. And a DM Megohmmeter played a large part in landing these jobs. Why not go after business the modern way — with STICHT electrical instruments?



USE THIS COUPON
FOR CATALOG

HERMAN H. STICHT & CO.
27 Park Place, New York, N. Y.

Send me catalog No. 40EC and prices on Megohmmeters.

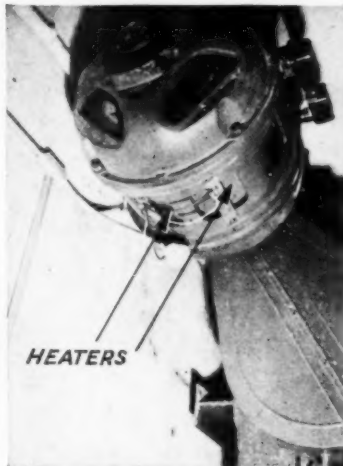
Name

Address

Moisture Protection

Extremely moist air in the grain germinating room of a Buffalo malt works made it necessary to provide constant duty driers for two 20 h.p. motors that are operated only once in 48 hours. Because these motors stood idle so long in this damp atmosphere, the previous motors had given much trouble from moisture-soaked windings.

During a recent modernization and re-wiring of this plant, new motors were installed for these friction shovel outfits. The Sterns Electric Equipment Company installed two 200-watt strip heaters against the underneath side of each



Winding Drier—Small strip heaters on motors in damp room keep windings dry during shut-down periods.

motor frame. These heaters are placed in operation when the motors are shut down, and a canvas cover is thrown over the motor to exclude moisture and catch the heat as it rises from the strip heaters below.

The heaters are secured to the motor with machine screws, through holes drilled and tapped in the motor frame. Operating from the 110-volt lighting system, these heaters are controlled by a vaporproof toggle switch and pilot light located on the wall directly beneath each motor.

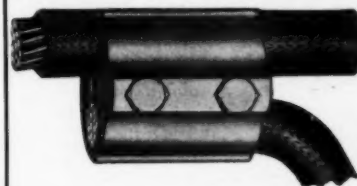
Corner Shop

A considerable saving in time is accomplished in an Eastern plant using one corner of the shop to set up a completely equipped individual "plant" to make wood models.

On a bench was placed a band saw, small circular saw, lathe and planer, all driven by a 1-hp. motor through a line shaft and V-belt pulleys.

K&H

PARALLEL TAP CONNECTOR



FOR 4-0 to 2000000 CM CABLE

COMPENSATES FOR DIFFERENT
SIZE WIRES.

MAKE QUICK, NEAT, DEPEND-
ABLE INSTALLATIONS.

A CONNECTOR TO FIT ANY JOB

Write for catalog showing complete line of Solderless Terminal Lugs and Connectors.

Krueger & Hudepohl

232-8 Vine Street, Cincinnati, Ohio

MARTINDALE SLOT INSULATION FOLDER



A remarkable time saver! Quickly folds slot linings from 1/8" up in width and up to 14" in length.

Uniform linings speed up armature winding. Three precision wheels permit quick adjustment.

Price—\$65.00 net, f. o. b. Cleveland, O. Net weight 79 lbs. Shipping weight 110 lbs.

MARTINDALE ELECTRIC CO.
1352 Hird Ave. Cleveland, Ohio

Gentlemen: Please send us

- ☐ One Slot Insulation Folder
- ☐ Descriptive Literature.

(Company)

(Street Address)

(City)

(State)

By (Name and Title)

ALABAR IVORY



MODERN AS TO-MORROW—
ECONOMICAL TO INSTALL

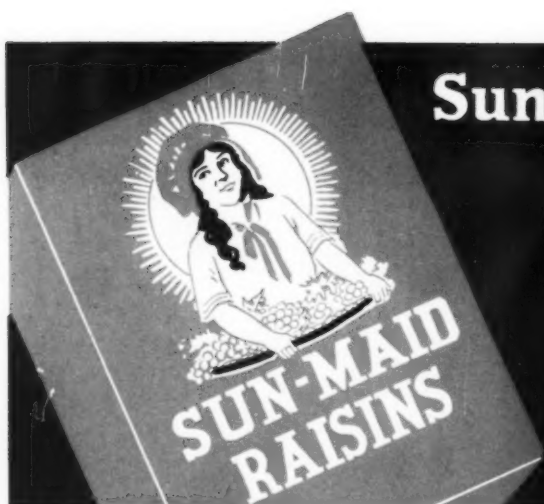
Alabar (Ivory) Wiring Devices can be found in America's finest homes—their ultra-smart design fits in perfectly with today's trend toward modern decoration.

And remember—the economies effected by multi-gangging of devices to permit their installation in a single-gang box brings the installed cost down amazingly low.

The P&S-Despard Line is sold through your electrical wholesaler.

PASS & SEYMOUR, Inc.
Syracuse, N. Y.

P&S-DESPARD WIRING DEVICES



Sun-Maid Raisin Growers
ABOLISH COSTLY
SHUTDOWNS
on raisin conveyors
by changing to . . .

FUSES MADE TO *protect*

So Says: Fresno Plant Electrician A.R. Cornelius

He continues: "We have seven conveyors that lift raisins from the receiving platforms to the fifth floor.

"Each is powered by a 7½ hp. 440 volt motor connected to a 30 ampere switch. Motor starting currents and temporary overloading of conveyors formerly caused almost daily fuse failures.

"Each failure was an expensive proposition as it stopped the steady flow of raisins to the treating and packing lines.

"In the Fall of 1934 we changed to BUSS super-lag fuses—to date but one of them has blown—and it blew to protect a motor that had run dry."

IF UNNECESSARY SHUTDOWNS are Stealing Your Money WHY NOT FIND OUT HOW...



BUSS



.. NOT TO BLOW

**...you too, can PREVENT
THE RECURRING SHUTDOWNS
caused by NEEDLESS BLOWS!**

If you are interested in profits or production—BUSS fuses have what it takes to win your friendship.

They are designed to do only one thing—to PROTECT THE USER'S POCKETBOOK.

THEY DO THIS IN TWO WAYS:

1. By safeguarding equipment, plant and persons against electrical hazards—and
2. By preventing wasteful interruptions of operating schedules—due to needless blows.

In other words, they are made to protect—not to blow. To be sure—there are definite reasons...

WHY BUSS FUSES DON'T BLOW NEEDLESSLY



10 FEATURES
in the design of the
FUSE-CASE help make
it possible

and



The SUPER-LAG
development in the
FUSE-LINK completes
the job.

Super-lag FUSES



GET THE FACTS ABOUT...

- Fuse-case design and what it means in abolishing needless blowing of fuses.
- Time-lag, a key to shutdown prevention.
- The Super-Lag development and how it increases safety on short-circuit blows. . . and many other interesting and valuable facts about fuses and their use.
- All set forth in easy-to-grasp style in the new BUSS book on "Fuses made to protect—not to blow."
- Your name and address will bring your copy by return mail.

BUSSMANN MFG. CO.
University at Jefferson • St. Louis, Mo.
Division of McGraw Electric Co.

*BUSS super-lag fuses are available
thru Electrical Wholesalers*

February EDITORIALS

Earl Whitehorne Editor

Your Partner Uncle Sam

When the American voter walked out last election day and turned loose a landslide behind our King Franklin, it chalked up a message for the business man. And the message said that public opinion in this country now favors a little more regulation of business and industry. Like it or not, there it stands.

The N.R.A. failed, for reasons that we know. But if the American people desire to limit the profits of business, or the employer's relations with labor or anything else, and they set their minds to it in the name of public interest or social progress or whatever they call it, there is no use kicking against the pricks. They will not fail. A way will be found.

So more legislation of this kind is coming. It will affect the contractor along with all the rest. But he need not take it lying down and help it to be bad. He can intelligently guide it, as it touches him, and help it to be good.

First, he must know what he needs and wants and is entitled to from his partner, Uncle Sam. Then he must be ready to assist this movement for more liberal government, to sound judgment and conservative action. That is what the voter wants.

What One Man Can Do

In the early days of the Codes, when all the business world was going to Washington, the electrical contractor went to the White House and said — "Knock! Knock!" But when General Johnson asked, "Who's there?" they did not have the right answer.

NECA said that it represented the electrical contractors. But NRA had never heard of such

an industry and would not talk about a code until 3500 contractors jointly signed a petition. Individuals meant nothing. Only integrated industries could apply for self government. And there is a lesson in that.

When it comes to taxes or social security or labor laws or other legislation that may now develop and affect the electrical contracting business unjustly, the voice of one man in a city will not be heard. Individuals will have no power to shape these laws when they are forming. But industries will.

To every contractor who wants to protect himself against injustice — and who does not? — and to assist his partner, Uncle Sam, in making wise laws to regulate business, the way should be plain. Organize in every city so that local opinion can be expressed. Unite in state bodies to wield the power of the cities. Then integrate all cities and all states in a constructive industry program through NECA. Then Washington will listen.

Voluntary Agreements

In all probability, Congress will soon be considering some sort of legislation to govern minimum wages and maximum hours in interstate business. The larger electrical contractor will not be affected because he now pays higher wages than any minimum that will be fixed and works fewer hours than the law will specify. But the smaller contractor is deeply concerned, for today he is struggling against the competition of men who work for as low as thirty cents an hour and as many hours in the day as there is work for them to do.

There is not the slightest doubt but what a labor standard, if enforceable, would return the house wiring and farm wiring business to the legitimate electrical contractor. And incidentally, while it would increase the cost of wiring over the present ridiculously low curbstone prices, it would give the public so much better work as to prove less expensive in the long run.

Contractors doing the larger class of work are concerned with a different kind of competition but one equally serious and disastrous. The solution of their problem is not so simple. The only means available for them that is not illegal is the voluntary agreement that has some form of financial punishment for violations that is legally enforceable.

Such a form of voluntary code has been developed by N.E.C.A., available to any organized community. Under the right conditions it can

be made to operate successfully. It should be studied in every city for the possible benefits it offers, pending whatever eventual Federal action may come.

Like a Three Horse Team

It was not so long ago that three important groups in our industry failed to see eye to eye on a mutual problem—that of keeping the wheels of industry turning. Today, the plant maintenance forces, the motor service shops and the electrical contractors recognize that they face a common responsibility. Each has a job to do. By doing it intelligently and cooperatively, using the best technique of modern equipment, tooling and design, each contributes something to make the other's work more effective.

As industry executives steadily become more aware of the importance of efficient electrical systems, their appreciation of these services increases. Industrial processes are being revolutionized over night. Electrical maintenance is no longer just a job of re-lamping, putting in fuses and cleaning off contacts. New equipment in controls, electronic devices, and instrumentation have given a technical status to the plant electrical forces.

The problems of the modern maintenance man have become complex. Service shops and contractors can well take counsel with him. Likewise, maintenance men can learn from the diversified knowledge of qualified shops and contractors. Each has his place in the economics of modern plant maintenance, rehabilitation and alteration. Such counsel will add on both sides to an already broad experience. Working together, their pooled experience will speed up a big job that has just begun.

Wha-Da-Ya-Mean Adequate?

If you want to sell goods to Frenchmen, you don't talk German. But electrical men go on with their industry gargon, expecting John and Mary to understand and get excited. This term of ours, "adequate wiring," is a fine example.

As far as the public is concerned, their wiring is adequate. Outlets may be inconveniently few, but men and women in homes, stores, offices and factories are quite unconscious that circuits are

overloaded or voltage is low. They are interested in other things. Only we worry about wiring.

To start an industry campaign to sell "adequate wiring" would be a great mistake. The words have no personal appeal and are too hard to sell. The idea must be expressed so that it means something to everybody—**something for them**. We believe it should be called "Full Comfort Wiring", when we are talking to the home, "Full Service Wiring", in stores or factories.

Then Mary will say, "What do you mean 'Full Comfort Wiring?'", and we can tell her in terms of her comfort. And when John asks, "What do you mean 'Full Service Wiring?'" we can tell him. And all the time we are talking their language, from their point of view.

Of course, some electrical man will now arise and protest—"But service wiring means . . . !" And the answer to that is—"It may to you, but not to John."

Wait For The Evidence

Unfortunate publicity has come to the electrical contracting industry in New York. Special Prosecutor Dewey, in charge of the local crusade against criminal rackets, has subpoenaed the books of I.B.E.W. Local No. 3, the New York Electrical Contractors Association, the Voluntary Local Code of Fair Competition and many member contractors. Following so close after the suit upon the same local by ten electrical manufacturers, the news is sensational and will travel far.

Nobody will question the sincerity of Mr. Dewey's organization, but too many forget that charges made by a prosecutor in the heat and zeal of a reform drive are neither evidence nor proof. It is possible that the union may not be guiltless. Perhaps some of the 45 contractors involved may have overstepped the law. If so, it is in the public interest and best for the electrical industry that the facts be bared, irregularities stopped and offenders punished.

The important point, however, is that none of these men should be prejudged on the mere weight of newspaper headlines. Until a grand jury has indicted and the case is tried, no one of them is compromised.



Corporation or Partnership [FROM PAGE 11]

substitute for it. This tax amounts to 8 per cent of net income on net incomes less than \$2,000 and increases to 15 per cent on the income in excess of \$40,000.

Let us assume that A and B, both being married and having two children, are the sole stockholders of a corporation. Let us suppose each draws a salary from the corporation of \$8,000 per annum, which is reasonable considering the services rendered by them, and that this and the dividends derived from the corporation constitute their sole income. Let us also suppose that after allowing for these salaries, the company has annual earnings of \$12,000, before taxes, and is required to distribute all such earnings in order to avoid paying the undistributed profits tax. This business would pay a normal corporate tax of \$1260.

Individual Taxes

In addition, the two stockholders would each have to pay individual taxes on their salaries and dividends received from the corporation of \$654.00, making the total corporate and individual taxes \$2568. But if the business were conducted as a partnership the total tax for both individuals, on the aggregate sum of \$28,000 derived from the partnership, would be only \$1530, a difference of \$1038.

In addition to the above disparity in Federal income taxes, there is a further discrimination against the corporate form of organization under the Social Security Act, under which the salary paid to A and B is taxed. So with respect to earnings for the year 1937, the following taxes would have to be paid to the government.

To be paid by the employer

1% on \$3,000 for each individual (To provide old-age benefits)	\$60
2% on \$8,000 for each individual (To provide unemployment insurance if eight or more individuals are employed)	\$320
	<hr/> \$380

To be paid by the employee

1% on \$3,000 for each individual (Old age benefits) ...	60
Total	<hr/> \$440

Ultimately under existing law the Social Security taxes will be as follows:

To be paid by employer

3% on \$3,000 for each individual (old age benefits)	\$180
3% on \$8,000 for each individual (unemployment insurance)	480
	<hr/> \$660

To be paid by employee

3% on \$3,000 for each individual (old age benefits)	\$180
Total	<hr/> \$840

This entire sum of \$840 would be saved if the Company were a partnership or proprietorship since partners' or owners' salaries are not subject to the tax.

In short, A and B, owners of the business, are required to pay out of the profits of their business \$1878 more than they would otherwise pay, solely for the privilege of operating as a corporation. Other taxes, such as the Federal capital stock tax and stock transfer tax would add somewhat to this disparity. And then a further advantage, which a partnership or individual proprietorship has over a corporation, from a tax standpoint, is the right to charge losses derived in the operation of one partnership against the profits of another.

Case for Corporations

From the foregoing, it is obvious that the savings in taxes which owners of a business may effect by converting a corporate form of organization into a partnership or proprietorship can not be lightly turned aside.

Meanwhile, of course, it is no less important to know, what legal advantages adhering to the corporate form of organization, are not available to partnerships or proprietorship. First and foremost is the limitation of liability of stockholders. In other words, in a corporate form of organization, the assets of the business alone may be subjected to the payment of corporate debts and the individual stockholders may not be successfully held responsible for the payment of any such debts, excepting that in some states the stockholders may be held responsible for wages. In the case of a partnership or proprietorship, however, the individual partner or proprietor may be held liable for all debts of the business. This is an important

element and must be carefully weighed against the gains which may accrue in taxes by operating as a partnership or proprietorship.

Other legal advantages incident to the corporate form of organization are:

1. Perpetual existence, whereas in a partnership death or withdrawal of a partner acts as a dissolution of the partnership.
2. Transferability of shares, whereas a partnership interest may not be transferred without dissolving the partnership.

From a practical standpoint these and other minor legal advantages are of no great importance, since all such matters could be effectually taken care of by a properly drawn partnership agreement.

Liquidation Tax

A further point which must be carefully studied before dissolving a corporation, is the possibility of creating a tax as a result of the dissolution of the corporation and liquidation of its assets. In such cases if the individual stockholders purchased their stock for a sum less than the value of the assets distributed to them, the transaction would give rise to a taxable profit, and thus might make the whole transaction undesirable. This danger is not present where a wholly new business comes into existence. Another consideration is the existence of laws in some states levying an income tax against unincorporated businesses.

It must be apparent that whether or not it is good policy in any instance to dissolve an existing corporation and to operate the business under another form of organization depends upon the facts in each case. A careful analysis of such facts by an expert in the light of existing tax laws, both State and Federal will demonstrate the desirability or undesirability of a change. One important element to bear in mind is the fact that if the tide should turn and the corporate form of organization should taxwise be put on an equality with a partnership or individual business, it would be a relatively simple matter to reincorporate. Under existing laws, if the change in the form of the organization is handled properly, there would be no danger of creating taxable income, as such transactions are ordinarily exempt from tax under specific provisions of the law.

"AT LONG LAST"

Fuseless SERVICE EQUIPMENT

for

RESIDENCES
SMALL STORES
FARM BUILDINGS
APARTMENTS, ETC.

at a new **LOW COST**
with **TRUMBULL'S**
MULTI-BREAKER



Send for the new TRUMBULL MULTI-BREAKER BULLETIN NO. 145. It contains full information and listings of all Load Centers and Multi-Breaker Panelboards.

Trumbull now offers the newest, perfected development in FUSELESS, low cost, service equipment for the home with TRUMBULL MULTI-BREAKER LOAD CENTER. Because of its unique, simplified construction, its few parts, compactness, safety features, convenience and economy, it seems destined to become the dominating system in its particular field.

This MULTI-BREAKER LOAD CENTER offers for residential use the same modern type of protection now installed in the nation's finest buildings . . . at practically the same cost as that of the ordinary switch and fuse.

It is tamper proof . . . the bakelite molded enclosure is sealed at the factory . . . no bridging with pennies. No fuses. . . . self indication of faulty circuit. . . . serves the new sequence with detachable meter.

It is being installed IN THE KITCHEN within the housewife's handy reach, and where runs of heavy wire to range, water heater, etc., are comparatively short.

SOLD THRU ELECTRICAL WHOLESALERS

The **TRUMBULL ELECTRIC MFG. CO.**

PLAINVILLE

CONNECTICUT

NEW YORK • CHICAGO • BOSTON • DETROIT • ATLANTA • PHILADELPHIA • BIRMINGHAM, ALA. • SAN FRANCISCO, CALIF. • LOS ANGELES, CALIF. • SEATTLE, WASH.

High Lights IN THE NEWS

N.I.S.A. SETS CONVENTION DATE

The 1937 convention of the National Industrial Service Association will be held at Chicago on April 19, 20 and 21. C. A. Sievert is chairman of the local convention committee. The program will deal with practical everyday problems of service shops.

Executive committeemen from nine cities came to Indianapolis on January 14. It was decided at this meeting to continue the compilation of winding data on standard motors, also to issue a bulletin and questionnaire on winding costs. A sub-committee was appointed to investigate new motor and control distribution principles. Reports were received and discussed dealing with "certified electrical repairs" and a "national exchange for rebuilt electrical equipment".

Present members of the executive committee are: E. C. W. Johnson, chairman, Indianapolis, Ind.; Wm. J. Wheeler, New York, N. Y.; J. E. Lauder, Kansas City, Mo.; A. L. Brown, Worcester, Mass.; A. F. Anderson, Nashville, Tenn.; W. W. Hanks, Charlotte, N. C.; J. P. Pilmer, Des Moines, Iowa; C. A. Sievert, Chicago, Ill.; F. W. Willey, Cincinnati, Ohio; H. H. Roessle, Pittsburgh, Pa., and J. Arthur Turner, Tampa, Fla.

BUFFALO BEGINS HELPER SCHOOL

Looking ahead, in the anticipated shortage of skilled electricians, a program of apprenticeship selection and training was scheduled to start in Buffalo, by February 1. A plan of schooling was worked out between the local electrical contractors and the electrical workers' union whereby the cost of instructors would be shared equally.

Night classes will be conducted at a local vocational school, and an enrollment of over 150 persons is expected. Journeymen as well as apprentices are invited to come and study practical electrical problems and code matters, so as to become better informed regarding present-day practice and the

latest developments in equipment. To insure regular attendance, apprentices will not become eligible for promotion to higher wage brackets until they have qualified in their night study courses.

New apprentices are to be selected hereafter from candidates recom-

CONTRACTORS MUST SELL

Depression experiences have not slowed up G. Fred Laube of Rochester. With a span of 32 years in business the Laube Electric Corp. today is doing better than ever. Important evidence is the sale and complete installation of 430 oil burners during 1936, and over 1200 such sales since tackling this line when business began to slump for contractors. Mr. and Mrs. Laube recently took a trip to Bermuda as a special reward for aggressive contractor selling.

A wiring crew of 10 men and a 12-man sales force keeps things busy for the Laube organization. Fred Laube



Fred Laube—A contractor of Rochester whose selling keeps him prosperous

says the public must be educated to patronize legitimate and responsible contractors. He chalks this up as one of the real selling jobs for associations everywhere.

mended by the employers, as well as those coming directly to the union for enrollment. Another arrangement with the local provides for a contractor to serve on the union's examining board for qualifying all helpers that apply for promotion to journeymen electricians. These conditions were agreed to when a new labor agreement was recently negotiated. On February 1 the wage scale for journeymen was to be increased from \$9 to \$10 per day, and on August 1, 1937, to \$10.50 per day.

On announcing this change in local labor relations, Karr Parker, chairman of the contractors' labor committee asserted that the need for planning the proper training of future electrical mechanics was recognized to be a mutual responsibility of the contractors. So by sharing in the cost of conducting a training school the contractors will have an actual interest in its program of instruction and a voice in securing new candidates for the electrical trade.

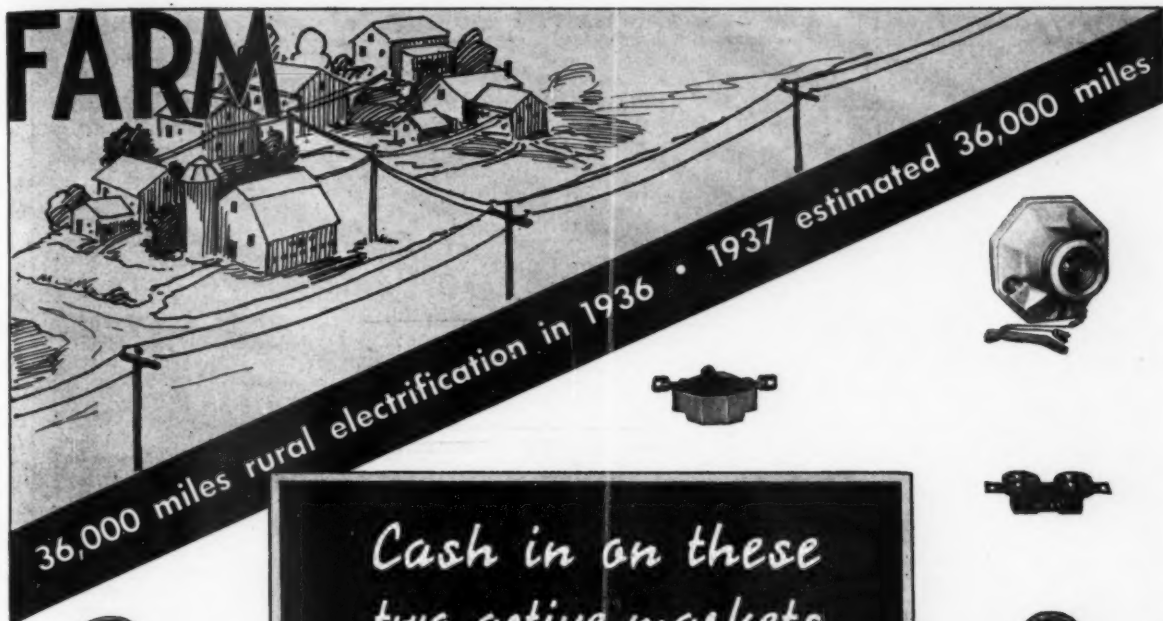
The rapid advance and development in electrical equipment has caused some journeymen to be lacking in a good knowledge of equipment and detailed drawings. These men will, therefore, be encouraged to take the night training courses. The contractors will assist in providing instructors and lecturers capable of providing practical training for men engaged in the electrical construction trade. Some of the engineers now working for various contractors will take active assignments as instructors.

ALLEGED RACKETEERING

New York newspapers broke out recently with headlines charging racketeering in the electrical contracting industry. Thomas E. Dewey, special prosecutor, now leading a crusade against criminal rackets in the metropolis charged that \$10,000,000 a year has been extorted from the public by a monopoly, maintained by strong arm methods, by Local No. 3 of the International Brotherhood of Electrical Workers and certain groups of electrical contractors. These charges were said to be based on a secret investigation of thirteen months.

Mr. Dewey subpoenaed the books of the local, the New York Electrical Contractors Association, the Voluntary Local Code of Fair Competition of New York City, the Electrical Industry of New York City, Inc., and many individual contractors. The membership of these associations embraces forty-five of the large contractors of the city who employ union men.

The prosecutor claims that many contractors have been driven out of the city by violence, as a result of conspiracy between the union and these large contractors. It is said that the records of the Consolidated Edison Company and Brooklyn Edison Company are also to be examined to determine the amount



Cash in on these
two active markets
with **PAULDING**

— a complete line
of wiring devices
priced for your profit.

WRITE FOR NEW CATALOG

JOHN I. PAULDING, INC. NEW BEDFORD, MASS.



Over 250,000 new homes built in 1936 • 420,000 homes estimated 1937



paid by the utilities to various contractors. No evidence has yet been published.

PIPE MAKERS WANT MORE STUDY

The Rigid Steel Conduit Association does not believe that the mere commercial purpose of simplifying stock is sufficient justification for doing away with black pipe. The conduit manufacturers want a non-commercial fact finding agency to make an investigation as to whether the present duplication of enameled black and galvanized white conduit should be ended.

The International Association of Electrical Inspectors recently recommended changes in the N.E. Code Rule 3017 in order to standardize white pipe. The N.E.P.A. committee on Article 300 is now giving the matter attention. The Conduit Association takes a neutral position, therefore, and in a recent resolution asks for a fact finding study. A. Penn Denton, consulting engineer for the association says—

"The Rigid Conduit Industry desires to see any proposed rule change in the National Electrical Code, which is intended to improve the efficiency of rigid steel conduit and other wiring materials forming a part of this wiring system, made only on the basis of engineering facts and technical considerations. The industry does not believe simplification of stocks (by which it would benefit) is of itself a sufficient reason for changing the Code rule. This Association will approve of and abide by any decision for change in the Code rule for coated materials, after consideration of proper engineering facts, and will be willing to bear its pro rata share of such fact-finding investigation pertaining to standard rigid steel conduit."

CALIFORNIA THERE THEY GO!

Electrical Wiring will receive major emphasis during 1937 from the Electrical Development League of Southern California, according to F. L. Hocken-smith, managing director. Business building activity designed to absorb the tremendous surplus of electric power available since the completion of Boulder Dam has run into the problem of inadequate wiring at every turn. Therefore, the planning committee is setting up the year's program to attack the problem of adequate wiring

on all fronts, covering the domestic, commercial and industrial fields.

The domestic program will feature the all-electric home and a great deal of publicity and promotion will be given to improving the wiring adequacy in existing houses. A budget of \$10,000 has been set up for promotional work. In the commercial field, likewise, efforts will be made to improve commercial wiring installations. Even the industrial program of the League will place high pressure on wiring adequacy in industrial plants and discuss the need for revamping many now outgrown electrical installations to take advantage of the abundant electric power.

A membership drive, in which electrical contractors participated, was launched at a great rally, on January 22, following a dinner and inspirational talk. Graduated scales of membership dues have been arranged so that even the small contractors in the Southern California area may take advantage of the promotional efforts of the League and join the campaign behind the slogan—"California's Electrical Age Has Just Begun."

HERMAN ANDRAE DIES

Herman Andrae, known throughout the electrical contracting industry as one of the pioneers of the business,



Herman Andrae—Pioneer Contractor

died in Milwaukee on January 13. He was 76 and had been ill for a year.

Mr. Andrae was the first electrical contractor in Wisconsin, a son of Julius Andrae, an early settler and locksmith, who in 1882 founded the famous electrical house, to be later known as Julius Andrae & Sons. In 1883 Herman Andrae began the development of an electrical contracting business, as part of his father's firm. After 1904 he ran it independently. In the years before transmission lines

35 Years Ago

St. Louis union wants employers to express opinion whether electrical workers or gas fitters should be hired to install "iron-armoured" conduit. Electrical Exchange favors electricians for this work.

Recommendation that a national committee be appointed to meet regularly with the Underwriters.

New York association lists tools required of journeymen. Included are four saws, mitre box, block plane, ratchet brace, angular bit-stock, 25 bits and countersinks, sundry chisels, gouges, oilstone, three wrenches, reamer, two screw drivers, four pliers, and 25 miscellaneous items such as pocketknife, alcohol brazing lamp, iron bench level, calipers, and pointing trowel.

A member writes in boosting a wire manufacturer who delivered 1000 ft. of 1,500,000 c.m. lead cable in three days for a plant breakdown job.

Editorial write up of "Johnson & Morton removable tablet boards". Main and branch wire connections are permanently fastened to sides of box below tablet. Ends of copper connecting pieces extend above tablet and from fuse terminals, thus the tablet is removable by taking out fuses and without disturbing any connections. Hailed as labor saving idea.

Jim Crow discusses at length adopting the National Electrical Code as a guide for electrical construction.

The items appearing above are all taken from "The National Electrical Contractor" of January, 1902, published by the National Electrical Contractors' Association.

VARNISHED CAMBRIC • RUBBER POWER CABLES • BUILDING WIRE • RADIO

WIRE • BARE WIRE • MAGNET WIRE • SERVICE ENTRANCE CABLE • CRESFLEX NON-METALLIC SHEATHED CABLE • JOBBERS CO-OPERATION—A PERMANENT POLICY

EXHAUSTIVE TESTS MAKE CERTAIN OF

QUALITY IN CRESCENT WIRE



A VIEW OF THE CRESCENT CHEMICAL AND PHYSICAL LABORATORY FOR TEST AND RESEARCH

At each important step in the process of manufacture, routine tests are made on each length of wire and cable to check physical and electrical properties and dimensions and to discover any imperfections in, or damage to, the insulating wall. In addition every length of wire or cable is immersed in water, usually for twelve hours, and while immersed is subjected to the specified high voltage and insulation resistance tests. Additional high voltage and insulation resistance tests are made on the finished cable ready for delivery, that is, after application of lead sheath, Parkway and all kinds of armors, braids, paints, etc., required.

JOBBERS
CO-OPERATION—
A PERMANENT
POLICY

CRESCENT'S LABORATORY AND TESTING EQUIPMENT PROVIDE
COMPLETE FACILITIES FOR EVERY REQUIRED TEST ON ITS PRODUCTS

CRESCENT
INSULATED WIRE & CABLE CO. INC.
TRENTON, NEW JERSEY

CRESCENT ENDURITE SUPER-AGEING INSULATION • WEATHER PROOF WIRE

Electrical Contracting, February 1937

SAVE TIME WITH

The MARR A Perfect Joint Connector (CAP MADE OF BAKELITE)



Neat in
Appearance



Easy
Inspection

Simple to
use



A post card
will bring
FREE
SAMPLES!

Appr'd by Underwriters

THE RATTAN MANUFACTURING CO.

552 STATE STREET
NEW HAVEN, CONN., U. S. A.
GENERAL SALES AGENTS HATHEWAY AND CO.
220 CHURCH STREET NEW YORK, N. Y., U. S. A.

THE

Badger

50 AMPERE

Synchronous
TIME SWITCH

... dependable
... at low cost

Here is a time switch that you
can depend upon to give absolutely
satisfactory service.

Sell quality and eliminate costly
service calls.



See your wholesaler or write for
complete descriptive literature.

RELIAANCE AUTOMATIC LIGHTING CO
1937 Mead Street Racine, Wis.

High Lights IN THE NEWS

[FROM PAGE 64]

were in general use, he specialized in installing electric power plants in industries, among them the large breweries that have made Milwaukee famous. At one time also his firm installed electrical equipment in post offices all over the nation.

Mr. Andrae retired from active business some years ago, and the Herman Andrae Electrical Company passed into the hands of his son, George Andrae, now an active leader in the contracting field. The death of his father, robs the industry of one of its most colorful personalities.

ARC WELDING FOUNDATION

To encourage study and research beneficial to the arc welding industry, a new Foundation has been established by the directors of The Lincoln Electric Co., Cleveland, Ohio. It has been named "The James F. Lincoln Arc Welding Foundation", in honor of the



Welding Pioneer—James F. Lincoln, in whose honor a fund has been set up for research in arc welding.

pioneer work of the company's president in promoting arc welding and in perfecting and developing arc welding equipment and electrodes. One of its primary functions will be the stimulation of original design in order that arc welding processes may be more widely utilized in modern fabrication.

FERNEDING ON ELECTRICAL COUNCIL

Paul Ferneding, supervising engineer of the New York Board of Fire underwriters has been appointed a member of the Underwriters' Laboratories Electrical Council. He succeeds J. C.

Forsyth who recently resigned his membership in the Council after having been an active member for more than thirty-five years. Mr. Forsyth is Consulting Engineer for the New York Board of Fire Underwriters.

PEAK VISITS ONTARIO

The Ontario Electrical Contractors Convention was addressed by Earl N. Peak, N.E.C.A. president, at a banquet held on the night of January 14. The convention lasted two days. A skit, "Creditable Credits", was presented on the first day, which involved a contractor, jobber salesman and a credit man. George W. Patterson, who directed the skit, was chairman of the speakers' committee.

Speakers discussed motor shop service, shop on wheels, rural wiring, Red Seal wiring, ethics, engineering, estimating, lighting, merchandising, inspector cooperation and other subjects. Officers for 1937 are: J. H. Turvey, president; W. P. Bennie, first vice-president; Gordon Alexander, second vice-president; J. O. Schatzke, secretary-treasurer; committee chairmen, A. Haid, education; G. Moes, publicity; J. Harvey Harris, finance; W. A. Millen, legislation; and R. Mitchell, membership.

PHILADELPHIA STARTS A 6-POINT PROGRAM

The contractors division of the Electrical Association of Philadelphia has set up six committees to work out a program for the early part of 1937 to deal with six major activities as follows: A voluntary code of bidding, licensing, sales promotion, trade relations, educational and legislative.

Temporary chairmen have been appointed for each committee by Howard L. Miller, chairman of the contractors' division. The members of each committee will elect their permanent chairmen when this activity gets further along.

BOSTON'S ELECTRICAL SHOW

The annual Electrical Trade Show of the Electrical Manufacturers' Representatives Club of New England is to be held on March 3, 4 and 5 at the Hotel Bradford, Boston. Plans are being made to take care of more than 100 exhibitors, and an attendance of at least 15,000 persons. The 1936 show had 90 exhibitors and 10,000 visitors.

The club has about 125 members, all of whom must maintain an office in the New England territory to be eligible. Officers of the club for 1937 are: R. P. Taylor, president; W. V. Haynes, vice-president; C. D. White, treasurer; H. J. MacDonald, secretary and also chairman of the Trade Show committee comprising nine other members.

The Opportunity is here Will you take advantage of it?

An Open Letter to all Electrical Contractors and Engineers

Private capital is again going into the building market after a five year rest. This means new jobs for you with profit, in commercial and office buildings, colleges and schools, hospitals, theatres and many other much needed buildings. The wiring and lighting of these jobs will call for the skill of the up-to-date contractor and engineer. No better method can be suggested for controlling the many lighting circuits than by "Diamond H" Remote Control Switches. They provide ease and convenience in lighting a few or many lights, they are economical in wiring costs, and save their own cost in the long run.

Suggest "Diamond H" Remote Control Switches on the jobs you get. We will help by suggesting proper switches or send you information to enable you to select them.

Use these modern switches. Let our service department be of help to you.



*Flood and Window
Lighting*

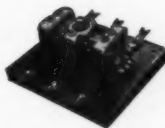


*Office Buildings, Banks,
Libraries*

The HART MFG. CO.
HARTFORD CONN.



*Theatres
and Auditoriums*



This is a standard Type "F" Remote Control switch and controls the lights in these different installations.

Send for Bulletin 10-B and the Don Graf Data sheets. Explains switches with wiring diagrams.



*Signs, Stadium
Lighting and Airports*

DIAMOND H SWITCHES



This photograph illustrates the convenience and economy of using Appleton No-Thread Unilets. Cramped quarters, tight corners, are easy for Appleton No-Thread Unilets.

LOW-COST WIRING WITH APPLETON NO-THREAD UNILETS



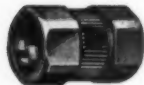
Type "T"
No-Thread Unilet



Type "C"
No-Thread Unilet



Type "LL"
No-Thread Unilet



No-Thread Coupling

Appleton No-Thread Unilets save time and labor because they are so easy to install. And after they're installed, they will last a lifetime, insuring low maintenance costs.

Insert the conduit—tighten the nut—the job's done. In tight corners and cramped working space, they are easy to handle.

Made of malleable iron, finished with cadmium, Appleton No-Thread Unilets resist corrosion and rust. There is a size and type for any job. Send for free catalog.

Sold Through Wholesalers

APPLETON ELECTRIC COMPANY

1734 Wellington Avenue

New York—76 Ninth Ave.
San Francisco—653 Minna St.
Los Angeles—340 Azusa St.

Chicago, U. S. A.

Detroit—7621 Woodward Ave.
St. Louis—420 Frisco Building
Atlanta—340 Marietta St., N.W.

APPLETON

No-Thread Malleable

The Original Threadless Conduit Fittings

UNILETS

Reg. U. S. Pat. Off.

vice-president; C. D. White, treasurer; H. J. MacDonald, secretary and also chairman of the Trade Show committee comprising nine other members.

More GOSSIP

White Pipe

Voluntary agreement among a majority of the contractors of Youngstown, Ohio, has almost completely eliminated the use of black enameled conduit, although there is no such requirement in the local electrical ordinance. Since this practice has become generally observed, various contractors claim their saving in time makes up for the additional cost of white pipe, while the customer gets a superior electrical installation.

Record Year

Kansas City wired 275 Red Seal homes in 1936, the largest number of residences recorded during the ten years that the Red Seal plan has operated in that city. In December, 20 homes were listed, seven of which had more than 100 outlets each. One had 174 outlets.

First Floor Service

In moving to larger quarters, the Fred W. Kiemle Co., of Toledo worked out a plan for serving its "while-you-wait" motor service customers quickly. Minor repairs on small motors and other light-duty equipment are done on the first floor, where the general



Sit-down Worries: Widespread strikes in the automobile industry have caused plenty of concern for E. E. Ismond (left), and Harry C. Turnock of the Hatfield Electric Co., Cleveland. This company enjoyed a steady volume of business during 1936 in auto plants at Cincinnati, St. Louis and Cleveland, but with plants shutting down and picket lines established, it has required lots of telegrams and phone conversations to care for idle electrical crews.

NEW STOCK-BIN LITE

- 1 Deep Reflector directs light to bins near the floor.
- 2 Lamp shielded by reflector reduces glare.
- 3 Reflector directs light upward above cutoff.
- 4 Apertures in the ends build up light between units.
- 5 White porcelain enamel surface produces diffused light.
- 6 Choice of hood designs simplifies installation.

NEW SIZE EXPLOSION PROOF FIXTURE

For the many locations requiring 200 Watt lighting intensity Benjamin has engineered this new size reflector which incorporates all of the 15 features of Benjamin Explosion Proof fixtures.

NEW BEAM DIRECTOR

Provides an additional ten to fifteen footcandles over a 24 x 30 area. Easily attached at any point of RLM Dome reflector. Direction of beam adjustable. Reflector of Alzak Aluminum.

3 new

Benjamin Electric Mfg. Co.,
Des Plaines, Illinois

SEND NEW CATALOG SHEETS

Name _____
Address _____
City _____
State _____

BENJAMIN DEVELOPMENTS

bring NEW SALES OPPORTUNITIES

Here are three valid reasons for calls on every customer and prospect. Few are the users of industrial light that cannot use at least one of these three new Benjamin products. A new Stock-Bin Lite that solves the problem of uniform lighting for bins, shelves and aisles in stockrooms and warehouses—a new larger size Explosion Proof Fixture—and a new Beam Director that fits into every type of RLM Dome reflector converting it into a combination spotlight and overhead light.

Catalog sheets containing complete details of these three new Benjamin products are ready . . . the coupon will bring them by return mail. Benjamin Electric Mfg. Co., Des Plaines, Illinois, Chicago, New York, San Francisco.

BENJAMIN
LIGHTING EQUIPMENT

Distributed Exclusively through Electrical Wholesalers

CONTRACTORS LIKE KILLARK FITTINGS BECAUSE

—they are easy to install and
the "flat back" makes them
stay put



The skilled workman selects Killark conduit fittings for quick, easy installation. He knows that the "flat back," when installed, will remain in position while screwing in or removing a section of conduit. He knows Killark cuts installation costs and gives the most for the money.

Killark Fittings are recommended for use in hazardous locations. A full range of sizes and styles is carried for any requirement. They are listed as standard by Underwriters' Laboratories.

Complete factory warehouse stocks are carried in 14 cities throughout the country and the contractor who wants proper fittings can have a complete and reliable source of supply, no matter where he is located. Get information on these fittings today. Ask for Catalog No. 12-B. Killark Products are sold exclusively through Electrical Wholesalers.



Type C with 5-hole composition cover



Type NC with blank cover



Type GEUE



Type GECME



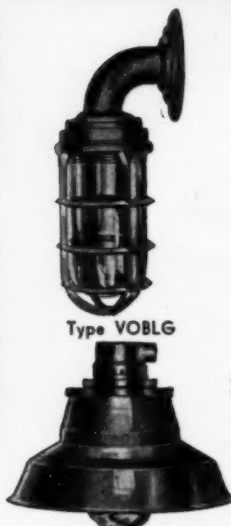
Type GCSC ground clamp



Type FB

KILLARK ELEC. MFG. CO.

3940 EASTON AVENUE, ST. LOUIS, MO.



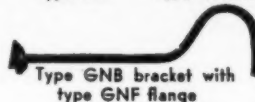
Type VOBLG

Type VUHR with reflector



Type SLB

Type VACTX



Type GNB bracket with
type GNF flange

More GOSSIP

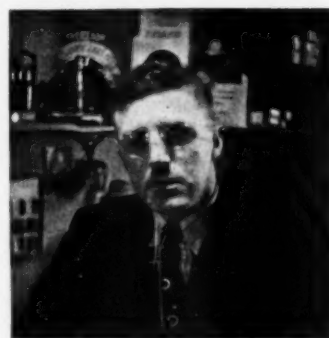
[FROM PAGE 48]

office, display and customer waiting rooms are also located.

Heavier equipment repairs are handled on the top or fifth floor, where they have the benefit of natural light and ventilation. With a five-story and basement plant, totalling about 36,000 sq.ft. of space, this company's expanded business is now being housed under conditions that more nearly suit the ideas of its hustling management.

No Butcher

Frame residences can be wired with electrical metallic tubing and still not butcher the studs and joists. T. H. Liddy of Dengler, Liddy, Burd Electric



T. H. Liddy of Elizabeth

cal Company of Elizabeth, N. J., has proved it. Over 400 outlets were recently installed in a job this way, including door switches for all closets, rigidly connected with tubing. Careful layout reduced boring and notching to a surprising minimum.

Tests Free

A sign hangs at the cashier's window of the Clark and Mills Electric Co., Cambridge, Mass., office reading: "Only a megger test discloses poor insulation of concealed wires. It's free." This suggestion helps sell wiring jobs.

Another Largest Sign

Hiram Walker Whiskey now tops all previous electric signs with the largest in the world—so claimed—on Chicago's outer drive. It burns 8,722 lamps and 1599 feet of neon tubing, and contains four miles of electric wiring and 900 ft. of high tension cable. It weighs 225 tons.

The sign is 250 ft. long and the largest letter is 33 ft. high. The load is 190 kilowatts. The publicity man

**CHOS[®]EN FOR
IMPORTANT
Mercury Lamp
INSTALLATIONS**

In 1936 again—Jefferson Transformers proved their high operating performance on thousands of mercury lamps in many of the country's leading industrial plants. • Designed and manufactured by specialists with long experience in the development of special transformers for Neon luminous and mercury vapor tubes, sun lamps, street lights,—and proven by years of actual service, Jefferson Transformers insure the full efficiency of mercury lamps,—full rated capacity, satisfactory performance,—and low current demand during the warming-up period. • Types for all installations—for both 230- and 400-watt lamps,—fully described in Bulletin 351-MV, JEFFERSON ELECTRIC COMPANY, Bellwood (Suburb of Chicago) Illinois. Canadian Factory: 535 College St., Toronto.

JEFFERSON
Mercury Lamp
TRANSFORMERS



LEADS AGAIN

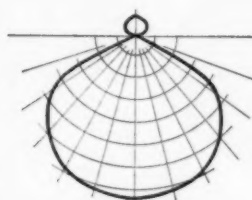
WITH THE

DUPLEX DOME REFLECTOR

PROVIDING DIFFUSE LIGHT UPWARD
WITHOUT EXPENSIVE AND FRAGILE
DIFFUSING ELEMENTS



Porcelain Enameled White



Distribution Curve

Characteristics are similar to the RLM Standard Dome with a small portion of reflected light diverted upward.

★ The Duplex Dome illuminates the upper walls and ceiling with diffused light and delivers direct light downward. Louvers formed in the metal walls of the reflectors divert sufficient light upward to relieve unpleasant contrast between the bright reflector and dark background. The white porcelain enameled exterior of the reflector and supporting stem are also illuminated.

In addition to the solid neck type illustrated Duplex Dome Reflectors are also made with heavy threaded socket-hoods to facilitate removal for cleaning. Available for lamps up to 500 watts capacity.

Patented and patents pending.

Member of RLM
Standards
Institute

QUADRANGLE MFG. CO.

32 S. PEORIA ST.

CHICAGO, ILL.



More GOSSIP

[FROM PAGE 70]

says too that it would take 136 men standing shoulder to shoulder to reach from end to end—but why should they do that”

Double Duty

What is good for doing automotive electrical repairs may often be applied with equal advantage to the motor service shop. Therefore, when “Steve” Davenport of the Columbus (Ga.) Armature Works purchased a small motor-driven machine for under-cutting the commutators on automobile generators, it was found to be equally adaptable to similar work on electric motors.

Youngstown Assn.

The Electrical Contractors Association of the Youngstown, O., district has elected officers for 1937. They are—Wm. H. Axelson, Youngstown, president; Warren I. Lewis, Warren, vice-president; E. C. Carlson, Youngstown, treasurer, and P. M. Geary, secretary.

Paging Ripley

A large operator in one of Long Island's house building centers has been reported as paying seven dollars per house for electrician labor. This pays two men for installing the service, all wiring, and the lighting fixtures. The materials are said to be furnished by the builder.

Follow the Sun

School lighting controls have been recommended in Buffalo to provide for time clocks to turn on the rows of class room units in the center of each room. Also, photo-cell controls are recommended to automatically control the rows of units next to windows. Thus the teachers have no lights to bother about, since the center-of-room lights go on and off before and after class periods and those lights near windows only come on when it becomes cloudy or dark outdoors.

Kansas City Officers

Kansas City Chapter, N.E.C.A., has just elected new officers—W. T. McAuley, president; G. G. Burkholder, vice-president; Fred E. Geiss, secretary; E. L. Fickie, treasurer; and, J. F. Costelow, G. V. Dameron, John Murray, Wm. Wachter, Wm. Luse, directors.

INCREASE YOUR PROFITS WITH THIS COMPREHENSIVE LINE OF **WAGNER FANS**

They have real sales appeal

Pedestal Fans



Conventional-Type



Popular-priced Fans



Ultra-Quiet Styled Fans

Window Ventilators



Ceiling Fans



Exhaust Fans



Ventilating Fans



Air Circulators

Correctly Designed... Aggressively Merchandised ...To Help You Enjoy Greater Volume and Profit

INCREASED sales . . . larger profits . . . greater volume in 1937 are within the reach of the alert and progressive dealer who can recognize the merchandising possibilities of a comprehensive line of new and improved fans. A few of the many reasons why an aggressive dealer can do a better fan sales job with Wagner's comprehensive line, are:

1. The fine styling attracts attention and stimulates buying.
2. The Wagner line includes fans in all price ranges, to appeal to all classes of buyers—no fan sales need to be lost because of price.
3. The 1937 Wagner line contains *five* low-priced fan leaders of various sizes and types—each a fast selling item sure to result in a greater volume of business.
4. Wagner air circulators, ventilating and exhaust fans have a wide field of application in all seasons of the year. They will help to level the seasonable slumps in your fan sales curves.
5. Included in the Wagner line are special-application fans, such as ceiling fans, exhaust fans, etc. which will stimulate the interest of engineers, contractors, managers, etc.—these fans offer another approach to the capturing of a large and profitable market.
6. The new items added to the 1937 line of Wagner fans enhance the possibilities of fan sales to new fan users and create new interest.

Now is the time to lineup with Wagner and increase your sales. Write today for complete prices, discounts and full information about the 1937 Wagner line of profit makers.

There are Wagner fans to meet the wants of every type of purchaser.

Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.

97337-1A

ELECTRICAL CONTRACTING

McGRAW-HILL PUBLISHING COMPANY, INC., NEW YORK CITY, ONE DOLLAR PER COPY
DECEMBER, 1936 • IN TWO PARTS • PART 2

The new and completely revised Buyers Reference Number for 1937 will help to simplify your buying.

Use it when you want to find out what to buy, where to buy, and who makes it.

WHERE TO BUY IT

A complete compilation of information in handy time-saving form for buyers of electrical and allied products.

1. Classified Directory of Manufacturers
2. Product Exhibit Section
3. Alphabetical List of Trade Names
4. Useful Buying Data

BUYERS REFERENCE NUMBER FOR 1937

News of NECA

A SOUTHEASTERN INDUSTRY CONFERENCE

Plans were approved by the Executive Committee for the holding of a Southeastern Industry Conference in Atlanta, Ga., on Monday and Tuesday, March 15th and 16th. Invitations have been extended to all power companies, electrical manufacturers, electrical wholesalers and electrical contractors in the following eight states included in the Southeastern Division: Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama and Mississippi.

The purpose of this conference will be to develop in that territory an industry policy that will coordinate all the branches of the industry into a solid cooperative selling unit for the promotion of new business. And the meeting will also give consideration to the rights and interests of all branches of the industry in the promotion of such an industry selling program.

EXECUTIVE COMMITTEE

The Mid-Winter Meeting of NECA Executive Committee was held at National Headquarters, New York City, on January 18th, 19th and 20th. All members were present with the exception of Mr. Feeley of Boston, who unfortunately was ill. Many important policy matters were acted upon and an intensive NECA program was developed for the coming year.

The next meeting of the Executive Committee will be held in Chicago about the middle of June.

MORE MEN FOR CODE WORK

Action was taken by the Executive Committee to request additional NECA representation on the Electrical Committee, N.F.P.A., in order to distribute

more equitably the work entailed in representation on the 38 Article Committees responsible for code revisions. At the present time NECA has two regular members and two alternates, resulting in a heavy burden upon each of these representatives in article committee assignments.

MORE USE OF LABOR MANUAL

The Committee on Manual of Labor Units reported on the large increase in the use of the manual and the interest

of the members throughout the country in this cost data service, which includes the issuance of new data sheets each month. The committee recommended that study of the manual should be encouraged through local Chapters for schooling of new members in using the manual.

It was also reported that copies of the NECA Manual of Labor Units have been loaned to various department heads of the Procurement Division, Treasury Department, Washington, and that these manuals are being used in checking estimates on Government work. It was voted by the Executive Committee that such loans of the Manual of Labor Units be made, with the approval of the Cost Data Committee, to other government, state and municipal officials, to be used as a standard in bidding, where it is considered that such distribution will be most effective and advantageous.

TO WATCH LEGISLATION

Action was taken by the Executive Committee whereby national headquarters will keep in constant touch with federal legislation during the coming year. NECA wants to be prepared to take action with reference to any bills or legislative proposals in Congress in which the interests of the electrical contracting industry should be repre-

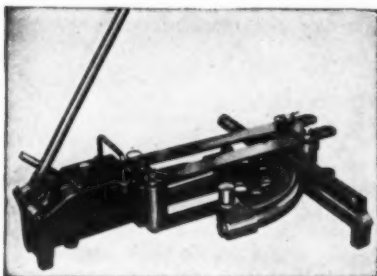


Looking Pleasant—NECA Executive Committee, meeting in New York, takes time out to attend to some rare beef. Around the table, beginning rear left, they are—E. C. Carlson (Ohio, W. Va., Ky.) A. L. Stone (Cal., Nev., Ariz.) S. G. Hepler (Wash., Ore., Ida., Mont., Wyo., Utah) A. Lincoln Bush (N. Y., N. J.) J. N. Pierce (Mich., Ind., Ill., Wis.) R. M. Walker (Va., No. Car., So. Car., Ga., Fla., Tenn., Ala., Miss.) Earl N. Peak, (President) H. A. Hood, (Ark., La., Okla., Tex., N. Mex.) H. C. Evans (Minn., Ia., Mo., No. Dak., So. Dak., Neb., Kan., Colo.) H. H. Tholen (Chairman, National Motor Section) G. W. Patterson (Eastern Canada) J. H. Schumacher (Western Canada) Laurence W. Davis, (General Manager) Robert W. McChesney (Penna., Del., Md., Dist. of Col.)

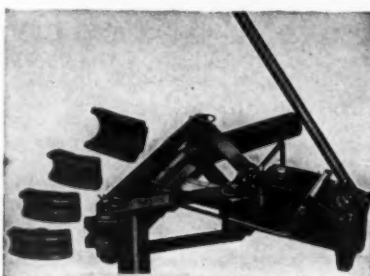
YOU CAN SAVE *time and money* WITH GREENLEE TOOLS

CONDUIT BENDERS • KNOCKOUT TOOLS • PIPE PUSHERS • BORING TOOLS

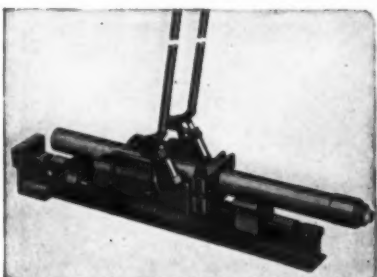
Every month many contractors are having the pleasing experience of making worth-while savings by using Greenlee Hydraulic Benders, Knockout Tools, Joist Borers, Bits, etc. Not only do they save money, but they do a better job. You, too, can profit by their use.



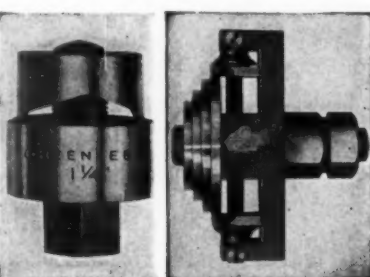
Above is the Greenlee No. 770-T Bender for thin-wall steel conduit. Same as No. 770, but with different attachments. Bends quickly and easily, without crushing. Complete forward movement of the ram makes full 90-degree bend. Will handle 1¼, 1½ and 2-inch conduit.



Above is the Greenlee Hydraulic Bender for rigid conduit. It is simple to operate, easily portable, and makes bends quicker and better than by other methods. No. 770 bends all sizes from 1¼ to 3-inch. The large bender, No. 775, handles all sizes from 2½ to 4¼-inch.



Greenlee No. 790 Hydraulic Pipe Pusher saves money on underground installation of pipe and conduit. Eliminates much trenching, back-filling, etc., and saves lawns and pavement. Easy for one man to operate. Will exert maximum pressure of 40,000 pounds on pipe clamp. Capacity for pipe from 1¼ to 4-inch.



Greenlee Knockout Tools enlarge holes for conduit quickly and accurately, without reaming or filing. Convenient to operate. Punches come in two sets. No. 735 is for ¼, ½, 1 and 1½-inch conduit, while No. 737 is for 1½ and 2-inch conduit. No. 740 Cutter will enlarge holes for 1½, 2, 2½ and 3-inch conduit.

GREENLEE TOOL CO., Rockford, Illinois

..... Mail This Coupon To-day.....

GREENLEE TOOL CO., ROCKFORD, ILL.

Please send information on the following tools:

☐ Rigid Conduit Benders ☐ Thin-Wall Conduit Benders ☐ Pipe Pushers
☐ Knockout Tools ☐ Joist Borers ☐ Electricians' Bits ☐ Bit Extensions

Name Address.....

City State.....

My Jobber is..... 2-37

News of
NECA

[FROM PAGE 75]

sented. Watchfulness will also be maintained regarding state legislation and, so far as possible, members within any state, in which proposed legislation will affect their interests, will be kept advised and action taken for appropriate representation.

WILL STUDY INDUSTRIAL MARKET

A report was submitted to the Executive Committee by R. M. Walker of Atlanta on the tremendous possibilities for increased business for electrical contractors and other industry groups in industrial lighting and plant modernization. The Executive Committee voted that the President be authorized to appoint a committee to study this field and to prepare a program on industrial lighting and plant modernization in which the cooperation of the entire industry may be enlisted.

SAFETY CODE REVISION

The request from the National Bureau of Standards, U. S. Department of Commerce, for NECA to appoint a representative to a new sectional committee for the next revision of the National Electrical Safety Code, was approved by the Executive Committee and the President was authorized to appoint. The National Electrical Safety Code is primarily concerned with outdoor distribution, sub-stations and power house safety standards, just as the National Electrical Code relates to interior wiring.

MOTOR SECTION PROGRAM

The following report and recommendations of the Committee on Motor Sections was adopted and approved by the Executive Committee:

1. It shall be the policy of this association to encourage the development of motor specialist organizations affiliated with the national association, either as sections of existing chapters or as independent chapters.
2. Organizations of motor specialists, affiliated with the national association and individual members of NECA engaged in the motor business, may register with the National Motor Section

Keep UP-TO-DATE on new developments through this

EXPLOSION-PROOF AND DUST-TIGHT WIRING

1. Bulletin 2520 describing conduit installations in hazardous locations with classification charts, diagrams of explosion-proof installations, tables of flammable liquids and gases. 116 pages of installation pictures and data. Crouse-Hinds Company.

POWER TRANSMISSION

2. Illustrated leaflet describes "Torq Drive," a short-center pivoted base attachment for individual motor drive applications such as lathes, milling machines and other equipment. Fred Polster Electric Co.

INSULATION TESTERS

3. Bulletin No. 400 describing Standco megohmmeters and megohmmers for working insulation tests. Also Bulletin Ms 378 covering Siemens Halake small insulation testers. Herman H. Sticht & Co.

TEMPERATURE RELAYS

4. Bulletin GEA-2525 covering Type ICT-self-reset temperature relays for protecting a.c. machines and transformers against abnormal heating. Explains features, construction, operation and characteristics. General Electric Company.

COMMUTATORS AND FIELD COILS

5. Folder 1205 describing methods used for the manufacture, testing and inspection of commutators for direct current generators and motors. Folder 1202 describes new bobbin-type field coils with waterproof sealing features. Reliance Electric & Engineering Co.

LIGHT-SENSITIVE CELL

6. Bulletin GEA-2467 giving technical and descriptive data on the G-E light-sensitive cell for the measurement and control of light. General Electric Co.

MACHINE LAMPS

7. Folio M.L.-2, 12 pages, covering Fostoria adjustable machine lamps, in two and three-joint models; also special bench models, brackets and bases. The Fostoria Pressed Steel Corp., Fostoria, O.

INDIRECT LIGHTING

8. A brochure tracing the development of artificial light to present developments in the use of indirect lighting units. Illustrations of recent installations of unusually effective indirect units are given. Silvrav Lighting, Inc.

NO POSTAGE NEEDED

"Knowledge is power." Know the developments in your field. Circle the numbers of the items you want on reverse side of this card and mail today.

NEW FREE SERVICE

Electrical Contracting brings you the latest literature of leading manufacturers without cost or obligation

WELDERS

9. Welder specifications Bulletin No. 315 covers "Shield-Arc SAE" a.c. motor driven models from 200 to 600 amp. Specification Bulletins Nos. 316 and 317 describing "Shield-Arc SAE" welders, with dual continuous control. These bulletins are supported by a special booklet on Arc Welding Technique. The Lincoln Electric Co.

POWER TRANSMISSION

10. Pocket-size catalog No. 51, 256 pages, covering gears, worms, sprockets and chains, speed reducers, "ratio motors," flexible couplings, grooved pulleys, ball bearings, and other power transmission accessories. Boston Gear Works, Inc.

PORCELAIN ACCESSORIES

11. Four-page bulletin covers "Knox" line of all-porcelain outlet boxes, covers. Knox Porcelain Corp.

SIMPLIFIED MOTOR MANUAL

12. A 48-page book "Electric Machinery Catechism" containing an explanation of 144 common questions regarding motors and circuits, for those who do not have an extensive knowledge of electrical phenomena or terminology. Drawings, photographs, sectional views, wiring diagrams and tables are included. Fairbanks, Morse & Co., Chicago, Ill.

BRONZE BEARINGS

13. A catalogue of graphite bronze bearings which lists inside and outside diameters and lengths of all standard bronze graphite bushings and sheave bearings. Randall Graphite Products Corp., Chicago, Ill.

THREADING AND WELDING

14. A 76-page catalog on equipment for welding and pipe and bolt threading including hand tools, portable threaders and power machines. The Oster Manufacturing Co.

WIRING DEVICES

15. A 64-page catalog covering the Paulding line of wiring devices including sockets, switches, plates, receptacles and other products. John L. Paulding, Inc.

PANELBOARDS AND CABINETS

16. Catalog No. 56 including 96 pages of service equipment, enclosed switches, cut-outs, cabinets, panelboards, distribution and stage switchboards and accessories. Frank Adam Electric Company.

WELDERS AND THAWERS

17. A folder describing six types of electric welders and thawers mounted on wheels and protected for use in the weather. Master Vibrator Co.

Postage
Will Be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 64, SEC. 510 P. L. & R. NEW YORK, N. Y.

ELECTRICAL CONTRACTING

330 West 42nd Street

30th Floor

New York, N. Y.

JUNCTION BOX AND FITTINGS

18. Bulletin 12-D describing the Ralco line of explosion proof gasoline pump junction boxes and fittings. Ralco Manufacturing Co.

CONNECTORS

19. The "Burndy News," a 16-page tabloid newspaper has just appeared featuring short articles with lots of pictures on application of connectors to typical problems in electrical connection work. Burndy Engineering Co., Inc.

INSULATING MATERIALS

20. Catalog No. 1 M.-1 describing complete insulating materials service for motor repair, central station and general industrial use. Products of 14 manufacturers included. Tape, varnish, mica, paper, magnet wire, shop tools and other accessories. Graybar Electric Company.

AIR-OPERATED CONTROLLERS

21. An explanation of operating principles of Brown air-operated controllers for the control of temperature, pressure, flow and liquid level. Catalog No. 8901, 32 pages. The Brown Instrument Co., Philadelphia, Pa.

LIGHTING FIXTURES

22. Catalog No. 40 featuring over two hundred fixtures, from ceiling porch lights to lighting standards, with a large variety of lantern brackets of varied design. The Herwig Company.

POWER TRANSMISSION DATA

23. A combined catalog of 40 pages with complete data and prices on Cog-Belt drives, Cog-Belt drives with Day-Steel pulleys, and V-Flat drives. Drives from fractional to 1000 hp. and over may be easily selected from tables

that include more than 22,000 standard drive applications. Catalog No. 180, The Dayton Rubber Mfg. Co., Dayton, O.

LIGHTING FIXTURES

24. Gruber Brothers has issued a new complete lighting fixture catalog No. 37, No. 3G.

SOLDERLESS CONNECTORS

25. Catalog No. 36, twenty pages, covers front lugs, various angular and off-set types; two-way, three-way, and crosses; stud and cable connectors, miscellaneous tap lugs, all for solderless connections in conductor sizes up to 2,000,000 c.m. Frankel Connector Co., Inc., New York, N. Y.

AUTOMATIC TIMING DEVICES

26. Folder describing improved Mark-Time switches for varied uses, including built in applications such as clothes washers, permanent wave machines, etc. M. H. Rhodes, Inc.

AUTOMOTIVE SHOP EQUIPMENT

27. Catalog describing portable electric drills, hole saws, sanders, grinders, also valve refacers, seat grinders, heat guns, polishers and cleaners for shop use. Black & Decker Mfg. Co.

INSULATOR TESTER

28. Catalog 11, Section 2 outlining "Hipot" insulator tester, a portable outfit for live line testing. For operating voltages of 11,000 volts to 132,000 volts and higher. Roller-Smith Company.

V-BELT DATA

29. Rockwood data books Nos. 782 and 783 are claimed to provide all the information needed to figure or select a Rockwood V-belt drive. Tables deal with power to be transmitted, V-belt

cross sections, sheave sizes to use, belt lengths and shaft center distances, horsepower per V-belt, and number of belts required. No. 782 is for drives up to 350-hp., while No. 783 covers single-groove drives up to 1-hp. Rockwood Mfg. Co., Indianapolis, Ind.

MOTOR SHOP SPECIALTIES

30. A complete listing of the Ideal line of products for motor maintenance and repairs is combined with maintenance information and handy electrical tables. Catalog No. 1-936, 68 pages. Ideal Commutator Dresser Co., Sycamore, Ill.

UNIT HEATERS

31. Catalog No. 125 describes the Ilg line of unit heater equipment. It contains data for estimating heat requirements, location of units, piping methods and tables, including several pages covering electric unit heaters. Ilg Electric Ventilating Co., Chicago, Ill.

MOTORS

32. Bulletins GEA-1326B, 1341C, 1366A, 1538A, 1619B and 2345 covering totally enclosed fan-cooled, explosion-proof, totally enclosed hoist duty, type K totally enclosed splashproof, and general-purpose squirrel-cage motors, respectively. General Electric Co., Schenectady, N. Y.

INSULATING MATERIALS

33. A listing of insulating tubing, sleeving, varnished cloths, tapes and papers, oiled silk, and various mica products is accompanied by a treatise on the origin of various insulating materials. Catalog No. 11. William Brand & Co., New York, N. Y.

SPEED REDUCERS

34. Booklet describing single and double reduction units of the single helical gear type for industrial and mining operations. Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

INDUSTRIAL LIGHTING

35. An 8-page bulletin covering the "Triple A" line of Guth Alzak aluminum industrial reflectors made in five types for various lamp sizes. The Edwin F. Guth Co., St. Louis, Mo.

WIRE AND CABLE

36. Detailed information, graphs and tables covering the characteristics and uses of "U.S." Laytex insulated communication cables, fire alarm and police signal cables, telephone cables, and other wire and cable installations for signal and control service. United States Rubber Products, Inc., New York, N. Y.

CIRCLE NUMBERS-SIGN-AND MAIL

ELECTRICAL CONTRACTING

February

Please send me, without obligation, manufacturers' literature herein described and identified by numbers circled below.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36

NAME..... TITLE.....

COMPANY.....

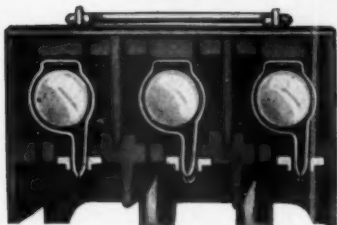
ADDRESS.....

CITY.....STATE.....

February, Electrical Contracting

New PULL FUSE SWITCH Panel Board UNITS

FA PULFUZSW



Cross section of FA PULFUZSW Unit showing positive clamping contact between silver-plated switch blade fuse clamps and switch contact slots.

FA PULFUZSW UNITS *Electrical, Mechanical, and Operating Features*

High-pressure switch contacts and low-resistance, large area fuse clamp contacts.

All current-carrying parts are substantial and heavily silver plated to assure long life and high conductivity.

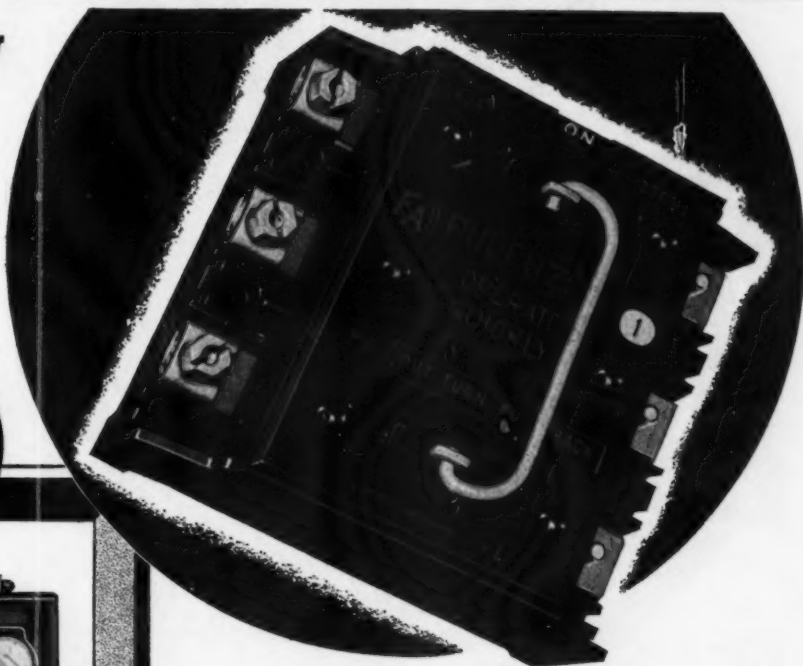
Fuses slide "easily" and quickly into place... No tools necessary.

Ample ventilation prevents over heating.

Visible "ON" and "OFF" indicator.

Terminals for bus or cable connections are integral with switch contact slots. Bakelite barriers in fuse clamp holders isolate each fuse in an individual compartment, preventing possible short circuits.

Quick, positive operation... To throw circuit from "ON" to "OFF" position pull out fuse carrier—turn 180°—and re-insert into base... Bakelite base and fuse carrier—light but strong.



A NEW UNIT *that is* *"The Sign of a Better Job"*

Here's another New FA development that does away with a lot of troubles on fuse connections—the FA PULFUZSW Unit that assures positive fuse clamping *pressure* contact over the maximum fuse area—provides for easy fuse insertion without tools—minimum installation time—ample ventilation to keep fuses from over heating while carrying their rated load—adaptable to almost any panel board assembly... Listed in catalog, pages 68 and 69, in 4 to 16 branches, inclusive... FA quality construction—competitively priced. 30 and 60 ampere capacities.



This New Catalog is Valuable to You

A really helpful "handbook" for Electrical Contractors... Contains complete engineering, reference and pricing data on the entire FA line of quality products.

Frank Adam
ELECTRIC COMPANY
ST. LOUIS



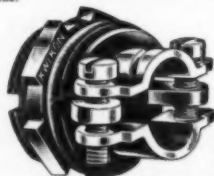
Kwikon Angle Squeeze Box Connector. Easy to clamp—sure to grip. Furnished in both 45° and 90°.



Kwikon Set Screw Box Connectors. Fastest and surest. The screw holds like a vise—it won't loosen.



Kwikon "No-Bolt" Stud. Employs no small bolts or nuts—saves 5/6 of installing time—produces better joint.



"Take-All" Connector. For Armored Cable, Flexible Metallic Conduit, or Non-Metallic Cable—either round or oval. Two screws provide double pressure with little effort.

KWIKON

3/8" HINGE
ARMORED CABLE
CONNECTOR

• Contractors are fast swinging to this Hinge type of Armored Cable Connector. It affords them greater speed in applying and that in turn means this little fitting does a full share in making the job more profitable. Also there is Kwikon dependability to consider—when you standardize on Kwikon products you always have the correct answer.

KWIKON COMPANY

626 W. JACKSON BLVD.

CHICAGO



A MARK OF QUALITY

News of
NECA

[FROM PAGE 76]

as members of that section entitled to vote in the election of the National Motor Section chairman and in the formulation of programs and policies affecting the motor specialist business.

3. Affiliated organizations of motor specialists shall have the right to send a delegate or delegates, who are members of the association, properly accredited, to approved meetings of the National Motor Section. These delegates together with individual members of the National Motor Section, shall at the annual meeting of the national association, elect their national chairman.

4. All actions and policies adopted by the National Motor Section at its meetings or by mail ballot shall be subject to approval by the NECA Executive Committee.

FLORIDA CONVENTION

The annual convention of the Florida Association of Electrical Contractors and Dealers will be held in the San Juan Hotel, Orlando, Fla., March 8th and 9th. Invitations have been extended to all electrical wholesalers, electrical inspectors and the utility men of the State to attend this convention.

Mr. J. J. Newell of Orlando is the new president of the Florida State Association, and Mr. Harold N. Lang of Orlando is their able and efficient secretary. Prominent industry leaders will be speakers on their program, including Earl N. Peak, president of NECA, and Ralph M. Walker, chairman of NECA Distribution Committee.

COST DATA COOPERATION

George W. Patterson, chairman of NECA Cost Data Committee, held a series of conferences at National Headquarters on January 21, 22 and 23, with representatives of the Cost Data Committee of the New York Electrical Contractors' Association in the analysis and preparation of new data for the NECA Manual of Labor Units. Thos. H. Kidney, of the firm of Harry Alexander, Inc., New York City, is chairman of the New York Cost Data Committee, and his committee includes representatives of outstanding local electrical contracting and engineering firms.

There has been similar cooperation of other groups throughout the country in the submission of cost data on



DISKONECT REFLECTORS

For R. L. M. Standard of Lighting Efficiency

You only have to see it to convince yourself beyond all question that the Goodrich Diskonect Reflector is the simplest of all. It's easier

to remove—easier to clean—to preserve the R. L. M. standard of efficient illumination. Comparison makes it much easier to sell. See it!



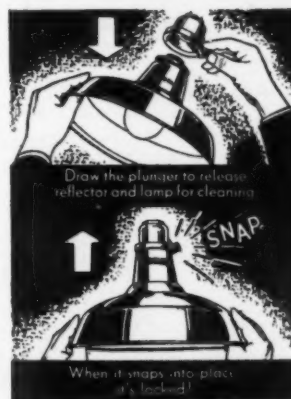
Easier to Remove and Attach

In an instant, you can remove the Goodrich Diskonect Reflector without fussing with tools or wiring. A slight pull on the plunger and the reflector and lamp are released from the hood. There is no twisting, tugging or forcing. To replace them after cleaning, you merely press into the hood and the spring-set plunger snaps into place to lock them securely.

Metal-to-Glass Contact Prevents Sticky Corrosion

Attachment between reflector and hood is porcelain enamel against a heavy, rustless cadmium plate. They can't corrode or freeze together even when not removed for long periods.

Here's the answer to easier maintenance of lighting efficiency. Sales are increasing rapidly. Users want it. Ask for information on the line of Goodrich Diskonect Reflectors. A post card will bring complete details.



ASK US TO SEND YOU CATALOG 36

GOODRICH

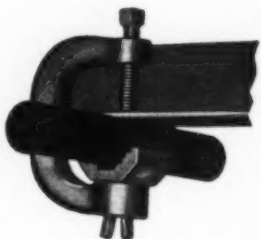
ELECTRIC COMPANY

OFFICES IN ALL PRINCIPAL CITIES

GENERAL OFFICES & FACTORY, 2902 NORTH OAKLEY AVENUE, CHICAGO, ILLINOIS

USE FULLMAN TIME AND MONEY SAVERS

Specify "LATROBE"—the complete line of floor boxes and wiring specialties.



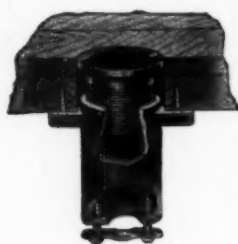
NO. 470 PIPE OR CONDUIT HANGER

Pipe support can be turned freely, permitting pipe to run parallel, or at right angles to beam. Eliminates drilling or use of straps. Will accommodate sizes of $\frac{1}{2}$ ", $\frac{3}{4}$ " and 1" pipe to steel beams $\frac{1}{4}$ " thick.

Fullman also offers Insulator Supports, Fish Wire and Conduit Benders.

FULLMAN

Easy installation, saves labor and money. No small complicated parts—simple, practical design.



NO. 300 "LATROBE" MIDGET FLOOR RECEPTACLE AND BOX

The only non-watertight floor receptacle and box on the market approved by the Underwriters' Laboratories for installation in wood floors.

FULLMAN MFG. CO.

LATROBE, PENN.

The one great pocketbook of practical electrical work

Just published—4th edition
Terrell Croft's

American Electricians' Handbook

1018 pages of direct help showing you how to handle every type of practical electrical job, \$4.00.

CROFT'S American Electricians' Handbook has become world-famous. Nearly a hundred thousand practical electrical workers know and respect this great pocketbook of practical electricity. It presents the kind of information that helps practical electrical men—wiremen, contractors, linemen, plant superintendents, operators and construction engineers—to select and install commercial electrical apparatus and materials intelligently for the performance of specific services. It gives the kind of data that will help them to operate electrical equipment efficiently and to maintain it at high operating efficiency.

Examine it
10 days

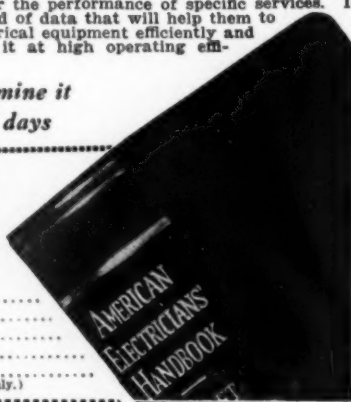
Use this book for:

- Practical suggestions for locating motor troubles—
- Quick methods for correcting both motor and generator troubles—
- Clear directions for proper installation of motors and generators—
- Explanations of fundamentals of practical electricity—
- Hints on efficient operation of motors and generators—
- Helpful data on transformers—
- Pertinent information on distribution problems—
- All the details the practical man needs on wiring for light and power.

SEND THIS ON-APPROVAL COUPON
McGraw-Hill Book Co., Inc.
330 W. 42d St., New York City

Send me Croft's American Electricians' Handbook, 4th Edition, for 10 days' examination on approval. In 10 days I will send \$4.00, plus few cents postage, or return book postpaid. (We pay postage on orders accompanied by remittance.)

Name
Address
City and State
Position
Company
EC-3-37 (Books sent on approval in U. S. and Canada only.)



News of
NECA

[FROM PAGE 80]

many types of installation work. An invitation is extended to all members of the national association to submit figures on individual jobs and special operations, as well as compiled data, to be used in making the NECA Manual of Labor Units as complete as possible. All data submitted is treated in confidence and the source of the data is never revealed.

MEMBERSHIP CLARIFIED

In response to inquiries from members as to the classification of their business under the new schedule of membership dues, the Executive Committee further clarified the basis of classification as follows:

The Constitution of the National Electrical Contractors Association defines members as persons, firms or corporations engaged in the business of electrical contracting and repairing, including the installation of electrical apparatus and materials, or engaged in the retailing of electrical supplies, or in both contracting and retailing. It further defines the term "electrical contractor" as used in the constitution to mean any individual or form of organization engaged in the business of erecting, installing, altering, repairing, servicing, or maintaining electric wiring, devices, appliances or equipment, including the purchasing from suppliers and the selling of manufactured parts and products. Therefore, classification of members' business for the determination of their dues shall be based upon their entire retail electrical business, including motor repair shop work, with the exception of the sale of second-hand motors and machinery.

A member of NECA having offices in two or more cities may pay his membership dues through the central office for the entire company based on the gross volume of business done through all of its branches. But if the classification is determined in this manner, it will be necessary for each branch office to furnish to the national association, advice from the local chapter in that city where such branch office holds membership, that their chapter membership is also in good standing, before that branch office can be recognized as a National member.

Material for this department is supplied by the headquarters staff of the National Electrical Contractors Association, 420 Lexington Avenue, New York.

FLOODLIGHT OF THE MONTH



No. 1 of a series to acquaint you with G-E floodlights—to help you increase profits.

General-utility Floodlight Type AL-49, 300 or 500 watt

HERE'S HOW IT IS MADE

Reflector—Spun Alzak aluminum, the new high-efficiency, long-lasting reflector material. Surface either etched or polished for wide or narrow beam spread, as desired.

Support and Cover—Die-cast aluminum alloy, attached with cadmium-plated brass screws.

Socket—Porcelain-base mogul socket, with nickel-plated metal parts, positioned for 7-in. light-center General Service lamps.

Mounting—Cast-aluminum mounting attachments of five types as shown below. Four feet of insulated cable included with each unit.

Enclosed floodlight is obtained by addition of heat-resisting door glass (either clear or colored) and aluminum retaining ring.

HERE'S HOW IT PERFORMS

Lamp	Reflector	Beam Angle	Lumens 300-watt	Lumens 500-watt
Clear	Polished	25°	1750	2900
Inside Frosted	Polished	50°	2100	3500
Clear	Etched	70°	2150	3600
Inside Frosted	Etched	100°	2900	4800

(Data for floodlight with plain, clear door glass—for open type add approximately 10% to lumen output)

HERE'S HOW YOU MOUNT IT



Swivel and stand Pipe clamp Crossarm Pipe top Slip fitter

HERE ARE ITS USES

This general-utility floodlight is mainly for medium- and close-range lighting of moderate size areas. Filling stations, parking lots, sign boards, roadside stands, and countless other small buildings and ground areas can be floodlighted easily and inexpensively with this unit. Industrial applications include storage yards, gates, loading platforms, driveways, and many others.

Suggested applications, lighting recommendations, and a convenient method for calculating floodlight requirements are in a complete floodlighting catalog. Ask for it from the nearest General Electric sales office or branch of the General Electric Supply Corporation. For further assistance, trained lighting specialists are at your service.

HERE ARE ITS PRICES

Open-type floodlight, with etched reflector . . . \$16.00
with polished reflector . . . 21.00

Enclosed-type, with clear glass and retaining ring,
add . . . 6.00

All above include crossarm bracket mounting.

For swivel-and-stand, pipe-top, or pipe-clamp mounting, add \$1.00; for slip fitter, add \$2.00.

All prices list, including freight charges.

HERE'S ITS PLACE IN THE LINE-UP



Type AL-35 Type AL-36 Type AL-49 Type AL-43 Type AL-48
100-watt 200-watt 300/500-watt 750/1000-watt 1500-watt

500-206

GENERAL ELECTRIC

Equipment NEWS

Lewexit Floor Outlet

C-A-C Lewexit, designed for housing electric light, power, telephone and signal circuits in one nozzle as a floor outlet. It requires one 2½" opening in floor surface. The body is made to accommodate four ¾" conduits with a



LEW-FITTINGS CO.

partition cast through the center, making this a two-in-one unit. Height of body 3½" below floor elevation, height of nozzle 4" over all above floor elevation. It is water-tight at this point. Lew-Fittings Co., 628 W. Jackson Blvd., Chicago, Ill.

Electric Disc Sander

This sander No. 77 is built for production and repair work. It is ball bearing equipped, with a high speed



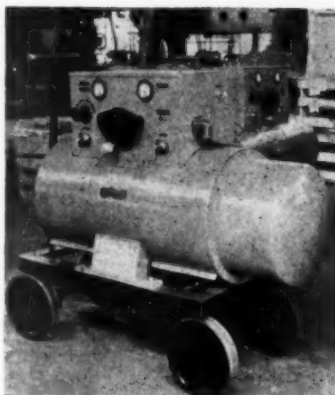
STANLEY WORKS

universal motor, streamlined for use in close places, light in weight and easy to handle. Equipped with acces-

sories, can be used to scour and clean vats, polish metal pipes, remove stencils, sand wood and metal, remove paint and rust, grind heavy welds, etc. Furnished complete with a 7" flexible pad, 12 sanding discs (6 for metal and 6 for wood) wrenches, and heavy rubber covered 3 conductor cable. Stanley Electric Tool Division, The Stanley Works, New Britain, Conn.

Electric Arc Welder

"Speedarc" welder, operates at (100%) power factor at full load and leading power factors up to 40% at no load, therefore supplies power factor



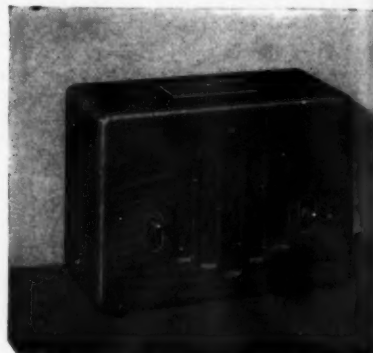
IDEAL ELECTRIC & MANUFACTURING CO.

correction. High efficiencies and welding speed and a fast arc. Sizes from 75 to 600 amperes in portable and stationary units. Ideal Electric & Manufacturing Co., Mansfield, Ohio.

Selective Call System

Electrocall multiple selective systems permit two-way amplified conversations by merely pressing a "talk-listen" key. Two types of systems are available. Model 200 is used for direct

communication between two points. Model 202 multiple selective systems consist of a master station and as many as six outlying stations. Auxiliary signals may be included for summoning individuals by code calls. Volume switching devices on the back



UNITED SCIENTIFIC LABORATORIES, INC.

of instrument control the voice and signal amplification. Operates from 110-volt a.c. or d.c. circuit. United Scientific Laboratories, Inc., New York, N. Y.

New 300 W. - Mazda

Equipped with a regular medium screw base, this lamp will replace present standard medium skirted 300-watt lamp. Bulb diameter is same as present 300-watt but all-over length of the "medium" is 1½ inches less than present skirted type. Because of certain temperature limitations this new lamp will not be supplied with "silver bowl" finish or with "daylight" bulb. General Electric Co., Cleveland, Ohio.

Generating Plants

Gasoline-electric generating plants for standby service in hospitals. Furnished with either d.c. or 60 cycle a.c.



ELECTRIC SPECIALTY CO.

generators, mounted on metal base, direct connected through flexible couplings. Safety enclosed panel boards.



PANTHER *and* DRAGON *Tapes*

MAKE \$ALES

Panther and Dragon tapes sell easily and quickly. Their rapid turnover makes them a favorite with contractors and dealers everywhere. Are you getting your share of this business?



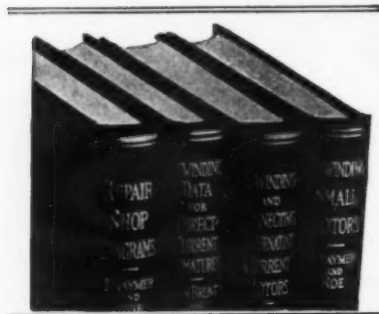
**HAZARD INSULATED
WIRE WORKS**

Division of

THE OKONITE COMPANY

Factories: Wilkes-Barre, Pa. Passaic, N. J.





NOW- how to repair and rewind all types of motors . . .

ELECTRIC MOTOR REPAIR LIBRARY

4 volumes, \$10.00, payable in easy monthly installments

THIS set of books should be on the shelf of every man who ever has to touch a motor for purposes of repairing it or changing it to meet different operating conditions. In shop language and with practical shop methods it covers every step in stripping, rewinding and connecting a.c. and d.c. motors of all kinds.

Do you know how to:

- lay out a wave winding
- test a.c. and d.c. motors to locate grounds, shorts, opens, quickly and positively
- properly record data when stripping armatures so that it will be instantly usable for correct rewinding by yourself or any experienced winder at any time afterward
- determine how many coils can safely be cut out
- lay out single-phase fan motor windings
- change single-phase windings for two- or three-phase operation
- make cross or equalizer connections on lap windings
- lay out frog-leg windings
- handle every step in a rewinding job from the time it comes into the shop until it leaves
- wind stators for tubogenerators
- band high-speed armatures
- rewind motors for voltage, speed, frequency, or cycle changes
- etc., etc., etc.

1,079 pages of practical shop methods and data on jobs like these in this library. A complete, modern key to repair of all motors. Nothing else in it; every page filled with definite, practical facts for the industrial maintenance man and the electric shop worker.

How to change motors for different operating conditions

Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results. Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of winding; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair man, including data difficult to get from any other sources.

Low price—easy terms—10 days' examination on approval

Bought separately the books in this Library would cost you \$11. By using this coupon you need pay only \$2.00 in 10 days and \$2.00 monthly until the special price of \$10.00 is paid. In addition, we give you 10 days in which to examine the books. Send no money; simply fill in and mail the coupon now; let us know your answer after you have seen the books.

McGraw-Hill Book Co., Inc.
230 W. 42nd St., N. Y. C.

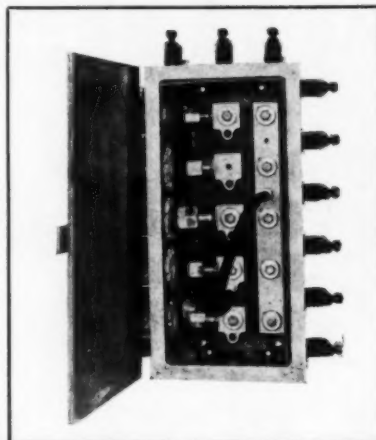
Send Electric Motor Repair Library for 10 days' examination on approval. In 10 days I will send \$2.00, plus few cents postage, and \$2.00 monthly for four months, or return books postpaid. (We pay postage on orders accompanied by remittance of first installment.)

Name
Address
City and State
Position
Company EC-3-37
(Books sent on approval in U.S. and Canada only.)

May be furnished with push button operated remote starting equipment. Electric Specialty Company, Stamford, Conn.

Cable Junction Box

The Everdur non-porous junction boxes protected against corrosion or immersion in acid or alkali surface waters. Box is welded, light in weight

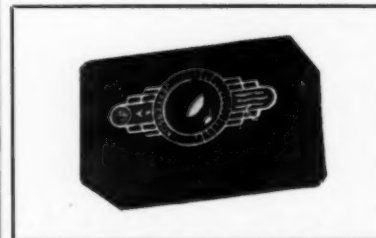


ANACONDA WIRE & CABLE CO.

and strong enough to resist accidental impact. Made in a variety of sizes and shapes. Anaconda Wire & Cable Co., 25 Broadway, New York, N. Y.

Temperature Controls

A line of temperature controls for industrial and domestic applications, with a bimetallic element to actuate a mercury switch. The mercury switch case is made of metal, completely sheathed in molded Bakelite. The new features of design are claimed to assure millions of operations with constant uniform regulation and ex-



JEFFERSON ELECTRIC CO.

treme accuracy on close operating differentials. Cases are of one-piece construction, finished in crackled art lacquer, with easily readable outside dials and knurled regulating knobs. Air Switch, Catalog No. 634-321, as illustrated above is designed for appli-

cations requiring remote control of the heating plant and regulation of the plant by room temperature, or the temperature of any body of gas. Range of adjustment is 25 deg. to 85 deg. The Jefferson Electric Co., Bellwood, Ill.

Feed-Through Switch

This feed-through cord switch is used to control an appliance or other de-

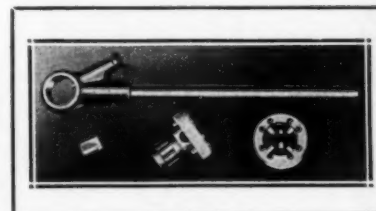


BRYANT ELECTRIC CO.

vice, or as a pendent switch for ceiling lights—No. 2880. It is made in black bakelite, single-pole, rated 10 amp., 125 v.; 5 amp., 250 v. A knob and strain relief metal cord grip is provided to adapt it for use as a pendent switch. The Bryant Electric Co., Bridgeport, Conn.

Ratchet Threader

For threading pipe or bolts in close quarters, the No. 2 Beaver open ratchet is available with dieheads for $\frac{1}{4}$ -in. or $\frac{3}{8}$ -in. conduit, for $\frac{1}{4}$ -in. to $\frac{3}{4}$ -in. pipe, or for bolts from $\frac{1}{4}$ in. to 1 in. Dieheads have oil holes and chip clearance and



BEAVER PIPE TOOLS

are said to hold dies in firm position. Dies may be inverted for threading close to walls. Beaver Pipe Tools, Warren, O.

Neon Transformer

Harmoniously designed neon transformer for window and showcase displays, known as the Acme B-eye-appeal. Semi-streamlined with dimensions that provide unlimited variety of installation adaptations and practical interchangeability of the glass tubing display units.

Design features: Transformer independently mounted and sealed in a center section box; primary and secondary lead connections in end caps; screw driver and pliers only tools necessary to make installation as all con-

YES~THEY ALL WANT

the EXTRA SALES PUNCH of Sterling

LITE-FLO REFLECTORS



Seven stores in a row enjoy plus lighting value of Sterling Lite-Flo Reflectors

6336 CERMAK ROAD BLOCK

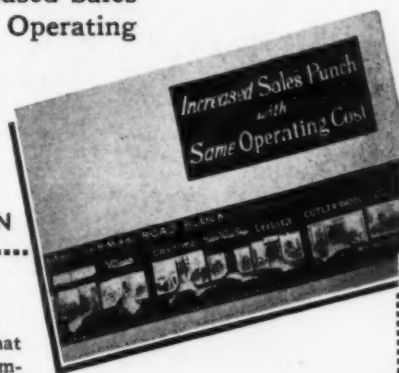
RED ROBIN Kety's Exclusive GAYTIME Better Value Shops LESLIE'S CUTLER HOES SALLY PROCKS



Big Department Stores—Small Specialty Shops—Chain Stores—alert merchandisers everywhere want the marvelous modern **Sterling FRONT-LINE** Lighting combined with double lighting effectiveness afforded by **Sterling Lite-Flo Reflectors**.

It's the key to lighting contracts for new stores and remodeled windows—the entering wedge that breaks down sales resistance of the shrewdest buyers. They **ALL** want double lighting effectiveness when it can be had with the same operating cost, and **Sterling Lite-Flo Reflectors** give it to them.

New brochure, "Increased Sales Punch with Same Operating Cost" tells the complete story. Write for your copy today.



MAIL THIS COUPON

REFLECTOR &
ILLUMINATING CO.,
1435 W. Hubbard St., Chicago, Ill.

Send copy of brochure that tells about the marvelous improvement in display lighting afforded by **Sterling Lite-Flo Reflectors**.

Name

Address

A LITTLE FELLOW*



MINERALLAC JIFFY CLIP

One size smaller than the
1/8 inch Pipe Jiffy.

* The No. 375

In Cadmium Plated Steel,
Everdur and Aluminum

Ask your Jobber

*New York City Office
Theodore B. Dally
50 Church Street*

MINERALLAC ELECTRIC CO.

25 N. Peoria St.,
CHICAGO, ILL.



For

Residence Wiring

The Best and Safest Method is
a properly installed KNOB and
TUBE job. Be sure and get the

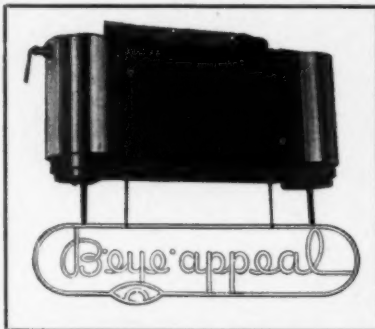


Assembled Knob because it "HAS
A GRIP LIKE ITS NAMESAKE."

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS



nections offer unobstructed working
space; an insulator with positive slip-
in spring contact; dual type insulator

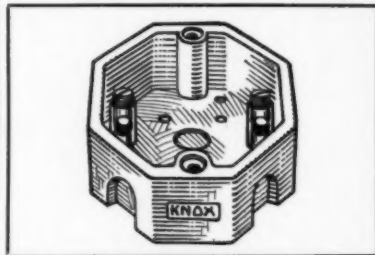


ACME ELECTRIC & MFG. CO.

is interchangeable for cable or direct
electrode connection. The Acme Elec-
tric & Mfg. Co., Cleveland, O.

Porcelain Box

Non-metallic boxes, covers, recepta-
cles, developed to avoid the need for
grounding as applied to rural electrifi-

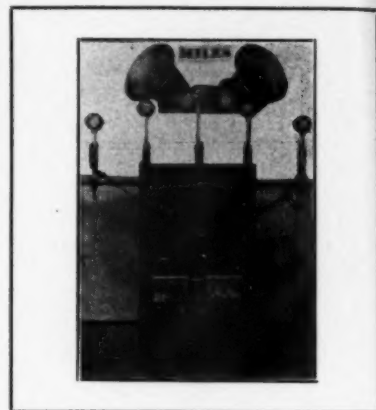


MILES REPRODUCER CO.

is made in three sizes, each of which
will take a range of rod and wire
diameters. Burndy Engineering Co.,
Inc., New York, N. Y.

Luncheonette Order System

A restaurant or luncheonette sys-
tem comprising 5 microphones mounted
in special housings, 5 counter type
stands, with built in boxes each con-
taining "talk" switches and indicator



Industrial Vacuum Cleaner

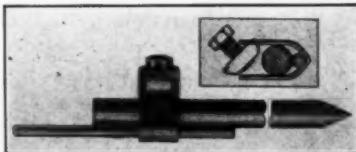
A portable electric Vackar vacuum
cleaner for industrial use. Equipped
with a 3-stage centrifugal fan, power-



BLACK & DECKER MFG. CO.

Grounding Connector

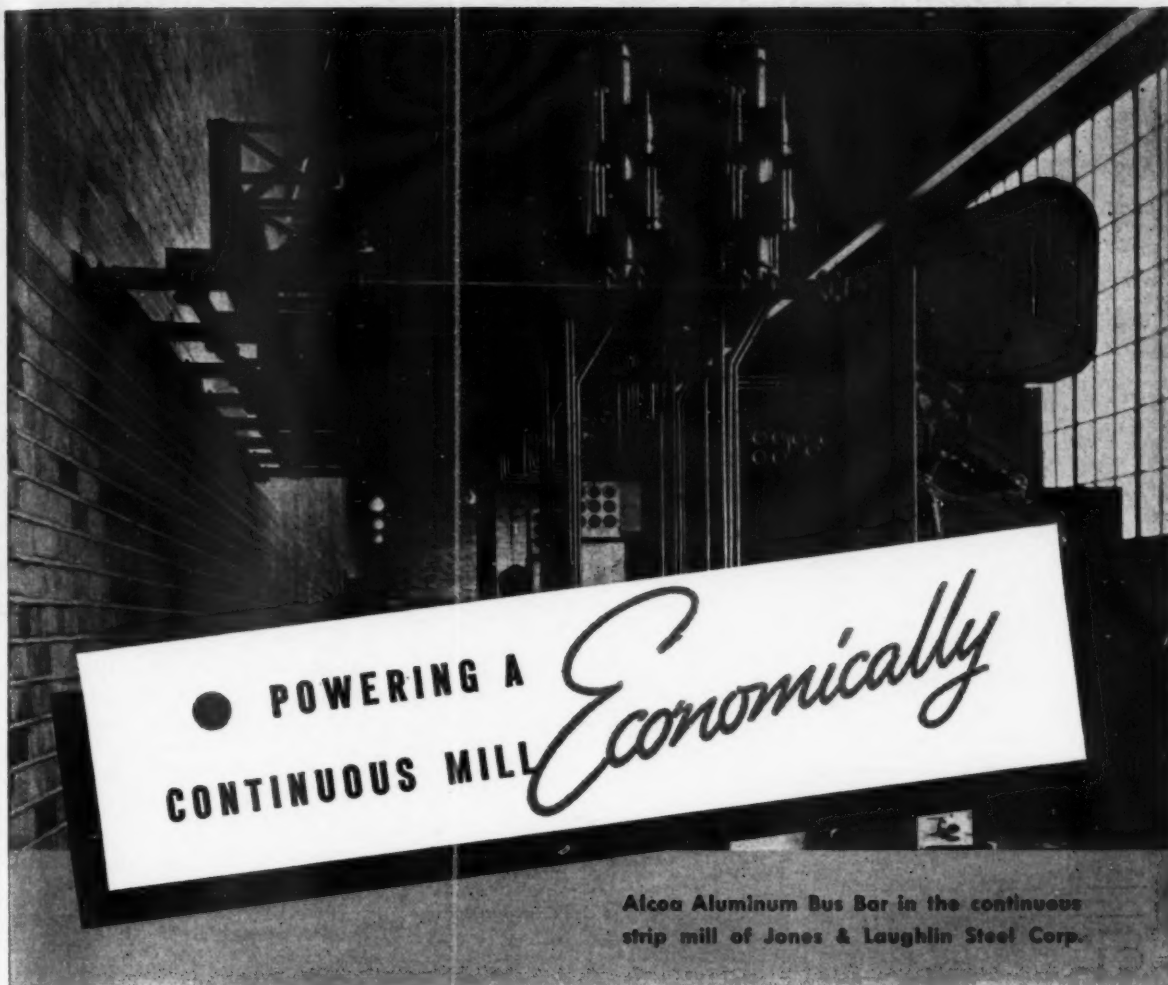
Groundem, type GH connectors are
for joining a ground lead to a driven
rod or pipe. It slips over the top of
the rod as a one-piece assembly. If
the rod or pipe has been splayed from
driving, it may be readily disassem-
bled and slipped around the conduc-
tors. Constructed of non-corrosive cop-



BURNDY ENGINEERING CO.

per alloys, making it resistant to un-
derground conditions. May be in-
stalled with an ordinary wrench and

ful universal motor, creates 40-inch
vacuum and pulls 35 cubic feet of air
through hose per minute. No dust
bag; uses metal container, easy to
empty. Black & Decker Mfg. Co.,
Towson, Md.



If this complete installation could be pictured, it would show what we mean by powering a continuous mill *economically*:

... Being at least 52% lighter, Alcoa Aluminum Bus Bar is easy to handle and support.

... Because Aluminum Bus is easily formed, it can be tailor-fitted to the individual layout.

... Joints are easily made, by bolting as in this installation, or by welding.

... Simple, inexpensive fittings are available.

For heavier electrical loads, the logical choice is Channeluminum, the rolled channel

section which gives the highest attainable combination of electrical, thermal, and mechanical efficiency. Its strength permits extra economy from longer runs between supports.

In plating-rooms and battery-rooms and for sulphur-laden atmospheres, the resistance to corrosion of Aluminum gives freedom from trouble without special protective measures.

Our engineers will gladly present the full story. Write to us for data now. ALUMINUM COMPANY OF AMERICA, 2197 Gulf Building, Pittsburgh, Pennsylvania.



ALCOA · ALUMINUM



**Built-in
KITCHEN
Vent Fan
FOR OLD OR NEW
HOUSES**



AUTOMATIC
EASY TO INSTALL . . .
ADJUSTABLE to wall
thickness no
wood nor metal frame
necessary no
screws in plaster,
wood or brick needed
to install.

The 16-inch quiet type fan removes cooking odors, steam, smoke and excessive heat quickly and quietly—a vent fan in demand. Available for A. C. or D. C. current; A. C. type is non-radio interfering. Automatic switch and shutters are controlled by opening and closing of the door. Opening the door starts the motor and opens the shutters. Closing the door stops the motor and closes the shutters. Attractive finish—inside and outside frames are polished cast aluminum, adjustable for wall thickness 7" to 13"—special for walls 12" to 24" at small additional cost. We'll gladly send you complete information upon request.

SIGNAL ELECTRIC MFG. CO.

Menominee, Michigan

Offices in all principal cities

SIGNAL

SHERMAN
BAKELITE **FIXTURE**
CONNECTORS

**The Best at the
Price of the Cheapest**



- Make truly safe "Pigtail" joints
- Mechanically strong
- Electrically safe
- One size only makes all needed wire combinations
- Best bakelite throughout

Free Samples on Request

Sold Thru Jobbers

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICHIGAN

The Approved List

[FROM PAGE 19]

conduit, service equipment, enclosed switches, wires and cords, will be found listed under Label Service. Devices such as domestic appliances, sockets and receptacles, outlet boxes and fittings, are listed under Re-examination Service.

Label Service is always recognizable by the presence of some form of the label on the product, carrying the Laboratories' inspection manifest. The particular label for any classification is shown plainly in the published List under that classification. It should be understood, however, that the presence of a label on or in connection with some device does not necessarily cover the complete assembly. The label on a cabinet or cutout box, for instance, applies only to the cabinet or cutout box itself, and does not cover devices or equipment which may have been installed in the labeled enclosure in the field. Similarly the bracelet label on the flexible cord attached to a vacuum cleaner applies only to the cord itself; and does not indicate that the complete cleaner is listed.

Reexamination

Products listed under Reexamination Service do not necessarily carry any reference to listing by Underwriters' Laboratories, Inc. However, at the manufacturer's option they may bear the Reexamination Marker. When cast, etched, molded, or die-stamped in a product, this marker may consist only of the letters "UL" in a circle; but when placed upon a device by means of a sticker or transfer, or a tag or on a containing carton, the marker includes the words "Listed under the Reexamination Service of Underwriters' Laboratories, Inc." in a ring surrounding the circle in which the letters appear. If the symbol appears in colors, the background for the letters "UL" is yellow, and that for the ring with the wording is red.

In using the List of Inspected Electrical Appliances it is important that plant electricians, contractors and inspectors bear in mind that listed products are not necessarily equivalent in quality or merit. The listing indicated only compliance with the requirements which apply. No distinction as to listing is made between products coming under Reexamination Service or Label Service. To be recognized as listed under the Reexamination

Service, a product must be marked for identification exactly as indicated in the published List.

Very frequently the identifying marking is the manufacturer's name or an easily recognizable trade-mark, but in some instances the marking is done by means of a symbol, abbreviation, or a colored thread as in the case of wires. It is quite important to note also that any marking which merely identifies a device or material as the product of a particular manufacturer does not necessarily indicate that the product is listed. The labels on devices or materials listed under Label Service speak for themselves. But a device to be identified as listed under Re-examination Service, must not only be marked exactly as indicated in the published List. It must also be mentioned in the List specifically by catalog number, type, style, or the like.

Finally, in using the List of Inspected Electrical Appliances, avail yourself of the comprehensive index and list of markings given at the back of the book. The latter is of particular value in identifying products which are branded with some symbol or trade name, or marked with something other than the manufacturer's name. For instance if you have before you on outlet box with a marking consisting of the letter "Q" in a triangle, reference to the list of markings will indicate that this is a trade-mark of the Q—Electric Company. Then under "Outlet Boxes" in the List (the catalog number of this manufacturer's particular box will be found, if it is a listed device.

More
GOSSIP

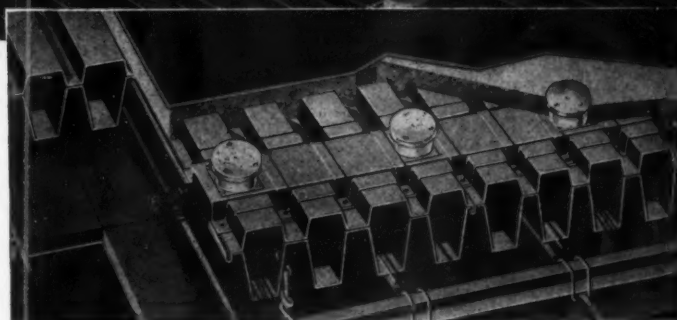
Association Helps

To prove the value of membership in local associations, Peter J. Quermback of Quermback Electric, Inc., Buffalo, cites some of the doings of the Niagara Frontier Electrical Contractors Association, of which he is secretary. Permit fees were reduced at an annual saving of \$75 yearly for the average contractor. Moreover the elimination of a local license board cut out an annual premium of \$20. Also, complaints may be registered, in confidence with the association by members, and many are adjusted satisfactorily with other industry groups, through the local's action.

EVERY CELL *a* PROTECTED WIREWAY

*for the distribution
of Wiring*

General view of the Robertson Floor in an insurance building, showing three of the typical topside headers (for 110-220 V single phase; telephone; low tension) that are used to provide a path from the panels, etc. to the allotted cells.



THE Robertson Steel Floor has caused a tremendous stir in the building world because of its strength, light-weight, speed of installation, fire resistance and other structural advantages. But the thing that has caught and held the attention of electrical engineers and contractors is that every cell of the Robertson Floor *can serve as a protected wireway* of generous capacity for the distribution of wiring!

That means a new method of wiring distribution. A better method. A more flexible and comprehensive layout. And one which gives your customers a better job . . . good for a longer time. Think what such electrical ad-

vantages as those offered by the Robertson Floor mean for the building owner. Prevention of premature electrical obsolescence. A convenient, safe and economical answer to every electrical need which may arise in the present or the future!

We have prepared a special booklet describing clearly and in detail the methods of wiring buildings in which the Robertson Steel Floor is used. It contains complete information on the floor . . . how to take advantage of

its electrical facilities. Layout data. Engineering data. Installation data. Everything you want to know. Send the coupon today for your free copy!

H. H. ROBERTSON COMPANY
Grant Building Pittsburgh, Pa.

H. H. Robertson Company,
2003 Grant Bldg., Pittsburgh, Pa.

Please send me, without obligation, your new book entitled "Wiring Robertson Cellular Steel Floor."

Name

Address

City State

With the MANUFACTURERS

FIVE NEW G-E VICE PRESIDENTS

Five new commercial vice-presidents have been elected by the board of directors of the General Electric Co., as follows: M. O. Troy of Schenectady, manager of the central station department; L. T. Blaisdell of Dallas, southwestern district manager; E. H. Ginn of Atlanta, southeastern district manager; A. L. Jones of Denver, Rocky Mountain district manager; and T. S. Knight of Boston, New England district manager.

Mr. Troy entered the employ of the General Electric Company in 1897; Mr. Blaisdell, in 1904, at 18; Mr. Ginn, began in 1901; Mr. Jones, in 1904; and Mr. Knight in 1903. The company now has nine commercial vice-presidents in charge of sales districts.

Duncan B. Mackie has joined Curtis Lighting, Inc., Chicago, as sales promotion manager. Mr. Mackie was formerly an advertising executive with the Benjamin Electrical Manufacturing Co. and later with Schweitzer and Conrad, Inc.

Killark Electric Manufacturing Co. of St. Louis is expanding its plant at Easton and Vandeventer Avenues to take care of their increased volume of business.

Roller-Smith Company, New York, N. Y., announces the appointment of H. A. Stanley as district sales agent in North and South Carolina, with headquarters at Charlotte, N. C.

Lost: A Socket

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., is offering a reward of \$50 for the return of the two-millionth Type S Meter Socket. It is marked and identified as the two-millionth socket. The finder will be rewarded upon the return of the socket to the company's plant at Newark, N. J.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., announces that its subsidiary company, Condit Electrical Manufacturing Corp. of Boston, Mass., will be operated as a company unit after January 1, 1937. It is now known as Allis-Chalmers Manufacturing Co., Condit Works. The plant will continue to specialize in the manufacture of switchgear products as a division of the Electrical Department under Mr. S. Fleshiem, Manager.

Lincoln Electric Company, Cleveland, Ohio, announces appointment of William F. Fischer to the sales staff of its San Francisco Office, and Robert Daniels in charge of their Chattanooga, Tenn., office located at 1015 Hanover St., in that city.

Ajax Flexible Coupling Co., Westfield, N. Y., announces the completion of a new factory addition providing increased manufacturing facilities. Wayne Belden, vice-president in charge of sales, in commenting on this expansion said: "Sales of couplings are up in step with the trend of machinery sales in general and the growing use of direct drive."

AUTOVENT PERSONNEL CHANGES

Autovent Fan & Blower Co., Chicago, announces promotions and appointments of representatives as follows: Tom Brown has been promoted to vice-president and general manager, while George J. Kalwitz has been promoted from sales engineer to general sales manager. Robert F. Ruggles, former manager of the New York office, has been made Eastern division manager.

New representatives recently appointed are Frank B. Nimmo, Minneapolis, Minn.; R. J. Engel, Appleton, Wis.; B. J. Engel, Milwaukee, Wis.; Industrial Representatives, Peoria, Ill.; Allan T. Shepherd of Richmond, Va.; Engineering Sales & Service Corp., of Louisville, Ky., and Harold M. Hudson of Seattle, Wash.

McGill Manufacturing Company, Valparaiso, Indiana, has appointed Mat P. Thiel of Chicago as general sales manager of its Electrical Division. Mr. Thiel succeeds Charles S. McGill, who will devote his time to other interests of the company.

Johns-Manville Corp., New York, has announced the promotion of Charles H. Roberts from general auditor to comptroller; Vandiver Brown from assistant secretary to secretary and W. I. Waite secretary of the officers' board. Arthur Olsen, who joined the company January 1, will be treasurer. Mr. E. M. Voorhees, secretary and treasurer, has resigned to accept the position of vice-chairman of the finance committee and a director of U. S. Steel Corp.

THREE-LIGHT LAMP PRICES REDUCED

Three-light incandescent lamps were reduced about 17 per cent in price on January 1, according to announcements from three leading manufacturers. The 50-100-150 watts bulb for table lamps was reduced from 60c to 50c, and the 100-200-300 watts size was reduced from 80c to 65c.

A reduction in the price of six-watt lamps from 20c to 15c is also announced. These lamps are used mainly as signal indicators with wall switches, also for plugging into convenience outlets in vestibules, along hallways, and in the bedrooms for low-cost safety illumination.

Revere Electric Co., Chicago, has moved its lighting equipment manufacturing department to a new building located at 1826 W. Kinzie St. This new building is said to cover about three times the area of its former plant.

Burndy Engineering Co., Inc., New York, announces having moved to larger quarters, at 459 E. 133rd St.

H. D. Wexelberg, advertising manager of Van Cleef Bros., has been elected president of the Advertising Managers Club of Chicago.

Classified Advertising

Position Wanted: Electrical construction engineer, long and valuable experience, estimating sales, engineering, installation, all types and sizes of projects; desires responsible connection with electrical construction organization. Box 21, Electrical Contracting, 330 West 42d St., New York City.

YOUNGSTOWN

QUADRUPLY OK'D

In Buckeye Steel Conduit the architect gets a dependable, known quality which never varies. The owner gets maximum durability. The journeyman gets easy workability which lightens his labors. The contractor is assured trouble-free installation which keeps his costs to a minimum. All four benefit when BUCKEYE CONDUIT is used throughout a job.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - - YOUNGSTOWN, OHIO

Sheets; Plates; Tubular Products; Conduit; Tin Plate;
Bars, Rods; Wire; Nails; Unions; Tie Plates and Spikes.
651



•HOT GALVANIZED • • • ELECTRO GALVANIZED.
•BLACK GALVANIZED...ELECTRIC METALLIC TUBING.



Complete Electric Plants

ONAN ALTERNATING CURRENT GENERATING PLANTS furnish the same electricity as city power lines. Made in sizes 350 to 10,000 watts to meet the requirements of those who must provide their own electricity for Farms, Summer Camps, Cottages, Boats, Commercial Purposes.

OPERATE ALL APPLIANCES

These A.C. Plants operate RADIO, HOUSEHOLD APPLIANCES, WATER PUMP, MOTORS—anything that normally would operate from city lines. Will run Public Address and Sound Car Equipment.

Modern Construction

ONAN PLANT Engines are like the Motor Car, Truck or Tractor engines. Operate on Gasoline, Gas or Distillate. Wiring and Installation is the same as for standard applications. Also 32 volt, Direct Current Models.

WRITE FOR DETAILS

D. W. ONAN & SONS

298 Royalston Ave., Minneapolis, Minn.

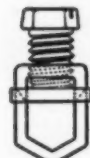
SIMPLE, ISN'T IT?

ILSCO



SOLDERLESS CONNECTOR

NOTICE: The triangular wedge formed by the tang and V-bottom collar, which forces the wire into a **solid mesh**—



- NO set-screw contact . . .
- NO flattening or separating of wires . . .
- NO limitation to one size wire . .
- NO shearing effect whatsoever . .
- NO special tools required to make connection . . .

NO need for you to search any longer for the PERFECT Solderless Connector—WE HAVE IT!



ILSCO solder lugs show the size of the largest wire they will take.

FREE—A large display board, containing mounted samples of ILSCO lugs. Sent upon request.

ILSCO COPPER TUBE & PRODUCTS, INC.
5629 Madison Road. Cincinnati, Ohio

Advertisers' Index

A	
*Adam Electric Co., Frank.....	79
Aluminum Co. of America.....	89
*American Transformer Co.....	38
Appleton Electric Co.....	68
*Arrow-Hart & Hegeman Electric Co.	39
B	
*Benjamin Electric Mfg. Co.....	69
Benolite Corp.....	94
Bull Dog Electric Products Co.....	4
Bunting Brass & Bronze Co.....	52
*Burndy Engineering Co., Inc.....	54
*Bussmann Mfg. Co.....	56-57
C	
*Chase Shawmut Co., The.....	53
*Colt's Patent Fire Arms Mfg. Co.	33
Consolidated Lamp & Glass Co.....	42
*Co-op. Electric Supply Co.....	94
*Crescent Insulated Wire & Cable Co.	65
*Cutler-Hammer, Inc.....	23
E	
*Electrical Safecote Conductors.....	24-25
F	
*Fairbanks Morse App., Inc.....	47
*Fullman Mfg. Co.....	82
G	
*General Electric Co.....	29, 35, 41
(Bridgeport)	
*General Electric Co. (Schenectady)	
Inside Front Cover, 83	
Goodrich Elec. Co.....	81
*Graybar Electric Co.....	6
*Greenlee Tool Co.....	76
H	
*Hart Mfg. Co.....	67
*Hazard Insulated Wire Works.....	26
I	
*Illinois Electric Porcelain Co.....	88
*Ilco Copper Tube & Products, Inc.	94
J	
*Jefferson Electric Co.....	71
K	
*Killark Elec. Mfg. Co.....	70
*Krueger & Hudepohl.....	54
*Kwikon Co.....	80
M	
*Mark & Co., Clayton.....	32
Martindale Elec. Co.....	54
*McGill Mfg. Co.....	52
McGraw-Hill Book Co.....	82, 86
Minerallac Electric Co.....	88
O	
*Ohio Carbon Co.....	51
*Okonite Co.....	85
*Onan & Sons, D. W.....	94
P	
*Pass & Seymour, Inc.....	55
*Paulding, Inc., John I.....	63
Peerless Elec. Co.....	50
Q	
*Quadrangle Mfg. Co.....	72
R	
*Rattan Mfg. Co.....	66
*Reflector & Illuminating Co.....	87
*Reliance Automatic Lighting Co.	66
Robertson, Inc., H. H.....	91
S	
*Sangamo Electric Co.....	31
*Sherman Mfg. Co., H. B.....	90
*Signal Electric Mfg. Co.....	90
*Square D Company, Inside Back Cover	
*Standard Transformer Co.....	94
*Steel & Tubes, Inc.....	48-49
Sticht Co., Herman H.....	54
T	
*Trico Fuse Mfg. Co.....	Back Cover
*Trumbull Electric Mfg. Co.....	61
U	
*United States Rubber Products, Inc.	2-3
V	
*Van Cleef Bros.....	28
W	
*Wagner Elec. Corp.....	73
*Wiremold Co., The.....	36-37
*Wolverine Tube Co.....	94
Y	
Youngstown Sheet and Tube Co.,	
The.....	93
* See 1936-1937 Buyers' Reference	
number of Electrical Contracting for	
additional information on these com-	
panies and their products.	

BENOLITE ELECTRIC INSULATION

Reliable electrical machinery demands dependable insulating materials. BENOLITE insulating varnishes and compounds keep electrical equipment on the job—protects it against moisture, acids, oil, etc.

For thirty years we have met and solved insulating problems of electrical machinery manufacturers. Our insulating engineers are anxious to serve you.

BENOLITE CORPORATION

Offices:
Henry W. Oliver Bldg., Pittsburgh, Pa.
Factory: Manor, Pa.



"Standardize on
STANDARD
Transformers"

ALL TYPES
Indoor and
Outdoor
Service

Send for
Descriptive
Bulletin

STANDARD TRANSFORMER CO.
Warren - - - - - Ohio



WOLVERINE SOLDERING LUGS

Superior Quality

Superior in design and workmanship. Wolverine Soldering Lugs are made from highest grade commercial tubing drawn from pure electrolytic copper. They are superior because made so. Solder always fit rated wire or cable. Square end design provides greater contact area, increasing current capacity. Solder never leaks out closed end. Have Underwriter's approval.

WOLVERINE TUBE CO.

1441 Central Ave., Detroit, Mich.
Stocks in All Large Cities

WHOLESALE OF Standard ELECTRICAL SUPPLIES

Electrical Devices, Appliances
Motors and Lighting Equipment

Lowest Market Prices—Fast Service

SEND FOR CO-OP MONTHLY

CO-OP ELECTRIC SUPPLY CO.
812 W. Jackson Blvd., Chicago, Ill.

S
es
nt
ce
D.
II.

237

UMI